C51.9/3 : 75/21

GOVERNMENT REPORTS

ANNOUNCEMENTS & INDEX

RECEIVED
MIAMI UNIVERSITY LIBRARIES
NOV 4 1975
DOCUMENTS DEPARTMENT

October 17, 1975

21

NTIS U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

GOVERNMENT REPORTS
ANNOUNCEMENTS & INDEX

Published every two weeks by the National Technical Information Service (NTIS). Annual subscription rates:

Government Reports Announcements & Index
Domestic $125 Foreign $160
Canada and Mexico $150

Domestic and foreign air mail charges will be quoted on request. Make remittance payable to NTIS and mail to a U.S. Department of Commerce District Office or to NTIS, Springfield, Va. 22161. Send change of address notice to NTIS.

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary
NATIONAL TECHNICAL INFORMATION SERVICE
William T. Knox, Director

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through March 1, 1978.

©National Technical Information Service 1975
All or portions of this publication are protected against copying or other reproduction outside of the United States of America in accordance with the provisions of Article II of the Universal Copyright Convention.

Before you begin research on your next project, see how you can save time and money with Published NTISearches

Here's a sure and inexpensive way to explore many potential solutions to problems in the fields of energy . . . environment . . . administration . . . transportation . . . and many more.

Choose from 500 Published Searches in the information categories NTIS customers most often request. Each Published Search lets you review up to 250 research summaries from such prestigious companies as Dow Chemical, RCA, Ford Motor Co., Bendix Corporation, Eastman Kodak, Teledyne, TVA, and Rand Corporation. These are the same high quality computer searches as a custom On-Line Search at one-quarter the cost . . . they're only $25!

The National Technical Information Service is the only central source of over 400,000 completed federally sponsored research reports and other analyses. Most of them aren't available anywhere else. NTISearch helps you locate just the report you need—when you need it. So act now. Send for the free Published Search brochure for details on 500 searches now!

The Federal Government's

FIRST PUBLIC SALE
of 500 Computer Searches into Advanced Technology

for businessmen, scientists, and specialists in urban, economic and social affairs.

MAIL TO:

NTIS
National Technical Information Service
U.S. DEPARTMENT OF COMMERCE
Springfield, Va. 22161

☐ I want to learn more about Published Searches. NTIS-PR-223.

☐ Also, send me your free booklet, NTIS Information Services, NTIS-PR-154.

NAME_____

ADDRESS_____

CITY_____ STATE_____ ZIP_____

GOVERNMENT REPORTS ANNOUNCEMENTS & INDEX

Volume 75, Number 18 September 5, 1975

Contents

Prices ii
About NTIS iii
NTIS Products iv
Subject Field & Group Structure v
Sample Entries vi
Reports & Translations 1
Subject Index SU-1
Personal Author Index PA-1
Corporate Author Index CA-1
Contract Number Index CN-1
Accession/Report Number Index AR-1

NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)

KEY TELEPHONE NUMBERS

Business hours: Monday thru Friday, 7:45 am to 4:15 pm

General Information ..... (Area Code 703) 321-8500
Customer Inquiry 321-8560
Order Desk 321-8543
Customer Accounts 321-8634
NTISearch (subject searches) 451-0560

NTIS Paper Price Schedule

Announcements in this journal are arranged in the 22 subject fields recommended in the "Committee on Scientific and Technical Information (COSATI) Subject Category List" (AD-612 200). Each field is subdivided into groups, as shown on page v.

NTIS has adopted a single price schedule for its printed reports. The new price schedule, effective November 1, 1974, covers reports now in the collection and those yet to be acquired. These are the basic paper copy selling prices. If, however, the cited price in an entry in this journal is greater than the basic paper copy price shown here, the cited price remains in effect. A few reports will continue to be specially priced. The exceptions are publications of Special Technology Groups and organizations for which NTIS acts as a sales agent and must honor that organization's price schedule.

Page-Count Price Schedule

Pages	Domestic Price (U.S. only)	Pages	Domestic Price (U.S. only)
1-25	$3.25	301-325	$9.25
26-50	3.75	326-350	9.50
51-75	4.25	351-375	10.00
76-100	4.75	376-400	10.25
101-125	5.25	401-425	10.50
126-150	5.75	426-450	11.25
151-175	6.25	451-475	11.50
176-200	7.00	476-500	12.00
201-225	7.25	501-525	12.25
226-250	7.50	526-550	12.50
251-275	8.50	551-575	13.00
276-300	8.75	576-600*	13.25*

For use outside the U.S. add $2.50 to U.S. price.

*For reports of more than 600 but fewer than 1000 pages, add $2.00 for each additional 100-page increment; for reports of 1000 pages or more, add $4.00 for each additional 100-page increment. Prices subject to change.

Reports in the NTIS collection are available indefinitely. For reports carrying the notation "NOT AVAILABLE NTIS," consult the report citation for availability and pricing information. The entry price code also indicates the form or forms in which the report is reproduced. Examples: PC (paper copy); MF (microfiche); magnetic tape (7- or 9-track, odd or even parity); punched cards; or microfilm.

About NTIS

The National Technical Information Service of the U.S. Department of Commerce is a central souce for the public sale of Government-sponsored research, development, and engineering reports and other analyses prepared by Federal agencies, their contractors or grantees. NTIS is also a central source for Federally generated machine processable data files.

NTIS ships 11,500 information products daily as one of the world's leading processors of specialty information. It supplies the public with approximately four million documents and microforms annually. The NTIS information collection exceeds 800,000 titles. All are available for sale. About 150,000 titles are in current shelf stock. Catalogs of special interest reports describe those most in demand.

NTIS is obligated by Title 15 of the U.S. Code to recover its cost from sales. The distribution of its information products and services is self-sustaining.

Timely and continuous reporting to subscribers is ensured by agreements between NTIS and several hundreds of Federal research sponsoring organizations. NTIS is the marketing coordinator for the latter, for their publications, technical inquiries, and special analyses.

The public may quickly locate summaries of interest from among 400,000 Federally sponsored research reports completed from 1964 to date, using the agency's NTISearch program which comprises On-Line Searches and this and many other Published Searches. An additional 180,000 citations of ongoing and recently terminated research projects compiled by the Smithsonian Science Information Exchange also are computer retrievable. Copies of the whole research reports are sold by NTIS in paper or microfiche.

The NTIS Bibliographic Data File on magnetic tape, which includes published and nonpublished abstracts, is available for lease. The computer products of other Federal agencies also are sold or leased.

Current summaries of new research reports and other specialized technical information in various categories of interest are published in weekly newsletters (Weekly Government Abstracts), which are indexed annually. An all-inclusive biweekly journal (Government Reports Announcements & Index) is published for librarians, technical information specialists and those requiring all the summaries categorized in a single volume and accompanying index.

A standing order microfiche service (SRIM) automatically provides subscribers with the full texts of research reports selected to satisfy individual requirements.

Other services, such as the coordination, packaging, and marketing of unusual technical information for organizations may be specially designed, anytime.

NTIS Products

About WGA

Weekly Government Abstracts comprise weekly newsletters in 24 categories, each carrying summaries of most unclassified federally funded research as it is completed and made available to the public. Abstracts of reports appear in as many categories as appropriate by means of a computerized cross-referencing system and do so within two or three weeks of their receipt by NTIS from the originating agencies. Generally, the technical report summaries have been prepared by the author. The last issue of the year is a subject index containing up to 10 cross references. The titles available are:

Administration
Agriculture & Food
Behavior & Society
Biomedical Technology & Engineering
Building Technology
Business & Economics
Chemistry
Civil & Structural Engineering
Communication
Computers, Control, & Information Theory
Electrotechnology
Energy
Environmental Pollution & Control
Government Inventions for Licensing
Industrial & Mechanical Engineering
Library & Information Sciences
Materials Sciences
Medicine & Biology
NASA Earth Resources Survey Program
Natural Resources
Ocean Technology & Engineering
Physics
Transportation
Urban Technology

For a price list and sample copies please write to Dr. Melvin Josephs, Managing Editor, National Technical Information Service, Springfield, VA. 22161.

About SRIM

SRIM (Selected Research in Microfiche) is an automatic biweekly service available from NTIS to help you expand your coverage of U.S. Government research and development at a cost within reach of a modest information budget. You limit your expense by receiving complete research reports (not just abstracts) in microfiche, but only in the subject areas you select — and at only $0.45 for each SRIM microfiche title instead of the regular $2.25 price. And you get the reports in microfiche without having to track down a specific report and order it. For further details, telephone SRIM Information (703) 321-8507 or write to NTIS.

About NTISearches

NTISearches are prepared by information specialists at NTIS from its on-line interactive bibliographic retrieval system comprising more than 400,000 document/data records. The NTISearches are of two kinds: Published Searches and On-Line Searches. Published Searches are prepared by NTIS analysts in anticipation of users' needs. On-Line Searches are prepared by these same analysts on a customized basis to satisfy a very specific user information need. Write NTIS for a listing of Published Searches and ask for PR-186 or call NTIS on the NTISearch Hot Line (703) 451-0560 to start a customized On-Line Search.

NTIS products can be made available in one or more of the following forms:

Paper Copy—Copies of the original report or reprint are furnished.

Microforms—The size of the microfiche film sheet is 105 x 148.75mm (about 4 x 6 inches); microfilm can be 35 mm or 16mm.

Magnetic Tape—Tape can be 7-track, 200, 556, or 800 bytes per inch (bpi), odd or even parity; or 9-track, 800 or 1600bpi, odd parity. Coding can be Bcd (Binary Coded Decimal) or Ebcdic (Extended Binary Coded Decimal Interchange Code).

Punched Cards—Furnished as 80-column cards.

Subject Field & Group Structure

(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft, Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology, Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings; Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection, Communications, Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Nonpower); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory; Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

Sample Entries

Report entries are arranged by COSATI group and field. Within fields they are arranged alphanumerically by Accession (Order) Number - alphabetic data precedes numeric.

AD/A-003 266/4GA PC$6.25/MF$2.25
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
PROJECT THEMIS: A CENTER FOR REMOTE SENSING.
Final rept. 16 Sep 67-15 Sep 73,
F.T. Ulaby, and R.K. Moore, Jun 74, 172p Rept no. CRES-TR-133-29 ETL-CR-74-10
Contract DAAK02-68-C-0089
See also AD-743 234.

Descriptors: *Radar mapping, *Target discrimination, Aerial reconnaissance, Data processing equipment, Preprocessing, Microwaves, Ultrasonic radiation, Image Intensification, Backscattering, Agriculture, Vegetation, Land use, Soils, Scattering, Spectrometry.
Identifiers: Themis project, *Remote sensing.

This report summarizes the technical work accomplished under Project THEMIS, A Center for Remote Sensing at the University of Kansas during the period 16 September 1967 through 15 September 1973. The highlights of the four major areas forming the remote sensing system are presented. A detailed description of the latest radar spectrometer results is presented.

Index entries are arranged alphanumerically. Titles are included in all indexes except Contract Number Index. Sample entries for each index follow:

Subject: Entries are sequenced by major subject term, second paired term, and accession number.

RADAR MAPPING
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI

Personal Author: Entries are sequenced by personal author, report title, and accession number.

MOORE, R. K.
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI

Corporate Author: Entries are sequenced by corporate author name, report number, and accession number. The monitor agency number is given following the report title.

KANSAS UNIV/CENTER FOR RESEARCH INC LAWRENCE REMOTE SENSING LAB
CRES-TR-133-29
Project THEMIS: A Center for Remote Sensing.
(ETL-CR-74-10)
AD/A-003 266/4GI

Contract Grant Number: Entries are sequenced by contract or grant number, corporate author, and accession number.

DAAK02-68-C-0089
Kansas Univ/Center for Research Inc Lawrence Remote Sensing Lab
AD/A-003 266/4GI

Accession/Report Number: Entries are sequenced by accession, report, or monitor agency number. Prices are given in this index.

AD/A-003 266/4GI
Project THEMIS: A Center for Remote Sensing.
AD/A-003 266/4GI 8F PC$6.25/MF$2.25

REPORTS ANNOUNCEMENTS

1. AERONAUTICS

1A. Aerodynamics

AD-A013 927/9GA PC$4.75/MF$2.25
Lockheed-Georgia Co Marietta
Evaluation of 3-D Turbulence Techniques for Designing Aircraft.
Final rept. 1 Oct 73-15 Apr 75,
Frederick D. Eichenbaum. Jan 75, 84p AFFDL-TR-74-151
Contract F33615-74-C-3004

Descriptors: *Jet transport planes, *Gust loads, *Dynamic response, Turbulence, Mathematical prediction, Power spectra, Three dimensional flow, Variations, Velocity, Frequency response, Mathematical models, Computer applications, Comparison, Assessment, Structural engineering.
Identifiers: C-5 aircraft, C-5A aircraft.

A recently developed multiple input power spectral technique is applied to predict the response of a C-5A aircraft to three-dimensional turbulence. Results are compared to the equivalent one-dimensional turbulence analysis, using corresponding C-5A dynamic response test data as a reference. Load variations range from an increase of 3% to a decrease of 14%. Because the coherence properties of the turbulence field are fully accounted for in the 3-d gust response analysis, theoretical results which depend upon the cross spectra between responses and probe-measured gust components tend to show a marked improvement over the 1-d case.

AD-A014 047/5GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Calculation of the Aerodynamic Loading on the Blade of a Main Rotor in the General Case of Helicopter Flight,
A. N. Bazilevskii, I. G. Pavlov, and A. K. Yanko.
30 Apr 75, 21p Rept no. FSTC-HT-23-431-75
Unedited trans. of Voprosy Aerodinamiki i Elektrogidrodinamiki Sbornik Nauchnyk Trudov (USSR) n6 p179-188 1970.

Descriptors: *Aerodynamic loading, *Rotor blades(Rotary wings), Helicopters, Helicopter rotors, Computations, Flight paths, Curves(Geometry), Translations, Mathematical models, USSR.

Expressions for calculating the aerodynamic loading on a helicopter rotor blade are derived for the general case of helicopter flight along some curvilinear trajectory. A one-rotor helicopter scheme is examined. Rotor blade-fuselage interaction is not considered.

N75-25869/9GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Numerical Calculation of Transonic Boattail Flow.
W. L. Chow, L. J. Bober, and B. H. Anderson.
Jun 75, 22p NASA-TN-D-7984, E-8065

Descriptors: *Boattails, *Transonic flow, Boundary layers, Finite difference theory, Inviscid flow, Numerical analysis, Pressure distribution, Subsonic flow, Viscosity.

For abstract, STAR 1317

N75-25870/7GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Comparison of Measured and Calculated Aircraft Lift Generated Pressures.
D. S. Findley. Jun 75, 17p NASA-TM-X-72707

Descriptors: *Ground effect, *Lift, Acoustic measurements, Jet aircraft, Pressure measurements, Sound pressure, Transport aircraft, Turbofan aircraft.

For abstract, STAR 1317

N75-25871/5GA PC$7.25/MF$2.25
Boston Univ., Mass. Coll. of Engineering.
Steady and Oscillatory, Subsonic and Supersonic, Aerodynamic Pressure and Generalized Forces for Complex Aircraft Configurations and Applications to Flutter.
M.S. Thesis.
L. T. Chen. 1975, 201p NASA-CR-142983
Contract NGR-22-004-030

Descriptors: *Aerodynamic drag, *Aerodynamic loads, *Aircraft configurations, *Flutter, *Numerical analysis, Aerodynamic coefficients, Aircraft wakes, Euler-lagrange equation, Lift, Mathematical models, Subsonic flow, Supersonic flow, Wing planforms.

For abstract, STAR 1317

N75-25872/3GA PC$3.25/MF$2.25
Boston Univ., Mass. Dept. of Aerospace Engineering.
Compressible Unsteady Potential Aerodynamic Flow around Lifting Bodies Having Arbitrary Shapes and Motions.
Semiannual Report, 1 Jan. - 30 Jun. 1975.
L. Morino. 30 Jun 75, 13p NASA-CR-142979, SAR-7
Contract NGR-22-004-030

Descriptors: *Aerodynamic configurations, *Compressible flow, *Lifting bodies, *Unsteady flow, Computer programs, Numerical analysis, Pressure distribution.

For abstract, STAR 1317

N75-25874/9GA PC$3.25/MF$2.25
Mississippi State Univ., Mississippi State. Aerophysics and Aerospace Engineering.
Numerical Solution of the Navier-Stokes Equations for Arbitrary Two-Dimensional Multi-Element Airfoils.
Semiannual Status Report, 1 Jan. - 30 Jun. 1975.
J. F. Thompson. 1 Jul 75, 8p NASA-CR-143038
Contract NGR-25-001-055

Descriptors: *Airfoils, *Navier-stokes equation, *Two dimensional flow, Incompressible flow, Laminar flow airfoils, Numerical analysis, Potential flow, Stream functions (Fluids), Vorticity.

For abstract, STAR 1317

N75-26305/3GA PC$3.25/MF$2.25
Boston Univ., Mass. Dept. of Aerospace Engineering.
Sussa Acts: A Computer Program for Steady and Unsteady, Subsonic and Supersonic Aerodynamics for Aerospace Complex Transportation Systems.
K. Tseng, and L. Morino. 1974, 13p NASA-CR-142978
Contract NGR-22-004-030

Descriptors: *Air transportation, *Space transportation, *Steady flow, *Subsonic flow, *Supersonic flow, Computer programs, Laplace transformation, Numerical analysis, Oscillating flow, Transfer functions, Transient response, Wing planforms.

For abstract, STAR 1317

N75-26311/1GA PC$5.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Induced Pressure Distribution of a Jet in a Crossflow.
R. L. Fearn, and R. P. Weston. Jul 75, 105p
NASA-TN-D-7916, L-9894

Descriptors: *Cross flow, *Jet exhaust, *Pressure distribution, *Transonic flow, Exhaust velocity, Flow velocity, Plumes, Subsonic wind tunnels, Turbulent flow, V/stol aircraft.

For abstract, STAR 1317

1B. Aeronautics

AD-A013 589/7GA PC$4.75/MF$2.25
Mitre Corp Mclean Va
A Description of the Intermittent Positive Control Concept.
A. L. McFarland, and B. M. Horowitz. Jul 75, 91p
Rept no. MTR-6587-Rev-1 FAA-EM-74-1-Rev-1
Contract DOT-FA70WA-2448
Supersedes AD-776 111.

Descriptors: *Flight control systems, *Collision avoidance, *Ground to air communications, Systems engineering, Automatic, Information systems, Display systems, Aviation safety.
Identifiers: Intermittent positive control systems, DOT/5A.

Intermittent Positive Control is a collision avoidance service provided to pilots by a totally automatic ground-based system. Collision avoidance is achieved by continuously providing pilots with advisory information on the location of nearby aircraft and by issuing avoidance commands on an 'as needed' basis. Intermittent Possitive Control provides protection both for pilots who are and for pilots who are not operating under the control of the Air Traffic Control System, while maintaining the freedom of action associated with uncontrolled flight. This document discusses the equipment necessary to provide IPC, the various services performed by the IPC system, and the processes by which the system determines its actions.

AD-A013 614/3GA PC-GPO/MF$2.25
Federal Aviation Administration Washington D C
The National Aviation System Plan 1976-1985. Appendix 2.
Mar 75, 108p
See also AD-756 580.
Availability: Paper copy available from GPO.

Descriptors: *Air transportation, *Management planning and control, Air traffic control systems, Navigational aids, Landing aids, Airports, Manpower, Research management, Radar equipment, Aircraft, Aviation safety.
Identifiers: National aviation system plan, DOT/2A, DOT/3B.

The Plan of 1975 is the sixth annual ten-year plan developed by the Federal Aviation Administration. It presents are integrated plan of action for meeting anticipated needs in the National Aviation System through 1985 and provides a focal point for industry/government

cooperation in agency planning. Long range plans are made and policies formulated with respect to, the orderly development and use of the navigable airspace, and the orderly development and location of landing areas, Federal airways, radar installations and all other aids and facilities for air navigation, as will best meet the needs of, and serve the interest of civil aeronautics and national defense, except for those needs of military agencies which are peculiar to air warfare and primarily of military concern. The Plan summarizes system additions, improvements, and changes required to meet realistic needs of aviation for the next decade. It is oriented to serve several different groups including aviation users who pay user charges, airport sponsors who build and maintain airports, aviation manufacturers who are helping to construct the system, and FAA personnel who operate and maintain the system.

AD-A013 640/8GA PC$4.25/MF$2.25
Naval Air Development Center Warminster Pa Crew Systems Dept
Prototype Fabrication and Testing of a Modified MA-2 Harness.
Final rept.,
M. J. Pavlick, M. Schwartz, and J. O'Rourke. 30 Apr 75, 57p Rept no. NADC-75034-40

Descriptors: *Survival equipment, *Naval aviation, *Crash landing, Restraint, Cables, Steel, Test methods, Pilots, Dynamic tests, Performance.
Identifiers: Restraint systems, MA-2 harnesses.

There has been concern by the U.S. Navy over the fact that many pilots have received fatal injuries in what are termed as 'Survivable Crashes'. The problem appears to stem from the excessive amount of dynamic overshoot and rebound associated with existing pilot restraint systems. Dynamic analysis of restraint systems in crash situations has shown that a rigid restraint system is desired if 'dynamic overshoot' is to be eliminated. In a previous study, a rigid restraint system was designed and subjected to a series of dynamic tests. Results of the test showed an improvement in crew member survivability with a rigid restraint system but improvement was needed. In the present program low elongation harness materials were obtained and incorporated into the MA-2 integral restraint and parachute harness. The test results are discussed.

AD-A013 925/3GA PC$7.00/MF$2.25
Dayton Univ Ohio School of Engineering
Landing Gear/Soil Interaction Development of Criteria for Aircraft Operation on Soil During Turning and High Speed Straight Roll.
Final rept.,
David C. Kraft, Donald A. Kahle, and Henry Luming. Jan 74, 179p AFFDL-TR-74-6
Contract F33615-73-C-3023

Descriptors: *Landing gear, *Soil mechanics, Military aircraft, Runways, Interactions, High velocity, Aircraft tires, Computer applications, Friction, Mathematical prediction, Takeoff, Drag, Test methods, Sinking, Loads(Forces).
Identifiers: *Unimproved runways, Aircraft turning characteristics(Runways), Landing gear soil interactions, Rolling drag.

The continuing design and operational requirements for military aircraft to operate on unimproved runways has led to the need to investigate those landing gear/soil runway parameters which most significantly influence performance. This report summarizes those activities accomplished during the first year of a two-year research effort concerned with the development of criteria for turning, operation at high speed, and multi-pass operation. The work accomplished consisted primarily of a comprehensive investigation of the turned aircraft tire/soil interaction effects and how these effects should influence future criteria for aircraft turning operations on soil runways.

AD-A013 996/4GA PC$3.25/MF$2.25
National Aviation Facilities Experimental Center Atlantic City N J
Evaluation of a Visual Departure Path Indicator.
Final rept. Jan 70-May 75,
E. Leon Reamer. Jun 75, 23p FAA-RD-75-99, FAA-NA-75-39
See also report dated Jun 73, AD-768 849.

Descriptors: *Visual aids, *Space perception, *Orientation(Direction), *Airports, *Takeoff, Laboratory tests, Flight testing, Lighting equipment, Searchlights, Navigational aids, Pilots.
Identifiers: DOT/IZ/IC, Visual flight rules, DOT/FZ/FA, Disorientation, Departure path indicators.

The report describes a technique and presents the result of tests conducted to evaluate a visual departure path indicator for suitability to prevent spatial disorientation when an aircraft, under visual flight rules, departs from an airport over land or water where no horizon and few visual cues exist. The work involved determining if it is an appropriate type of system to use. After a satisfactory testing period the equipment was moved to an airport where spatial disorientation might be encountered and an in-service test was performed. The results are discussed.

AD-A014 035/0GA PC$3.75/MF$2.25
Cincinnati Univ Ohio
Dynamics of General Chain Structural Systems.
Annual rept. 1 Apr 73-31 Mar 74,
Ronald L. Huston, and Chris E. Passerello. 1 Apr 74, 27p Rept no. UC-EA-040174-1
Contract N00014-72-A-0027-0002
See also report dated Dec 74, AD-A014 035.

Descriptors: *Cockpits, *Crash injuries, *Human factors engineering, Mathematical models, Acceleration, Crashes, Computerized simulation, Safety belts, Aircraft seats, Dynamic response, Naval research.
Identifiers: Occupant simulation.

The report contains a summary of the task items completed and initiated during the year. It also contains a brief outline of tasks to be completed in the coming year. Finally, the report contains in appendices a discussion of seat belt modelling, seat modelling, limb angle constraints, and acceleration profiles. The appendix also contains some specific impact data results. Other results are reported in the form of technical papers, as listed, and in the program user's manual--a separate technical report.

AD-A014 040/0GA PC$5.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Plan for Flight Testing Intermittent Positive Control.
J. W. Andrews, A. L. McFarland, J. F. Golden, M. E. Perie, and J. C. Koegler. Jun 75, 109p Rept no. ATC-46 FAA-RD-74-210
Contract DOT-FA72WAI-261
See also AD-773 397. Prepared in cooperation with Mitre Corp., McLean, Va.

Descriptors: *Air traffic control systems, *Collision avoidance,*Flight testing, Man machine systems, Pilots, Automation, Interfaces, Test facilities, Mission profiles, Display systems, Communication and radio systems, Operation, Intercept trajectories, Data acquisition, Data reduction, Aviation safety, Test methods.
Identifiers: Intermittent positive control, DOT/5A, DOT/3M.

Intermittent Positive Control is an automated aircraft collision avoidance system requiring the participation of the aircraft pilots involved. The operational interface between pilots and the IPC system is being evaluated in a series of live flight tests. The Lincoln Laboratory DABS Experimental Facility, augmented to include the IPC function, is the test bed for these evaluation flights. This document described the objectives and methods of the IPC flight testing being conducted by Lincoln Laboratory.

AD-A014 041/8GA PC$4.25/MF$2.25
Federal Aviation Administration Washington D C Information and Statistics Div
Commuter Air Carrier Operators as of September 1974.
Apr 75, 61p

Descriptors: *Air transportation, *Commercial aviation, Passenger aircraft, Cargo aircraft, Statistical data, Value, Seats, Capacity(Quantity), Classification, Regions, Models, Operation.
Identifiers: Commuter airline industry, Common carriers, DOT/2A.

The Civil Aeronautics Board (CAB) in 1969, issued amendments to the Economic Regulations for air taxi operators. One of these required all air taxi operators to register before July 1, 1969, and annually thereafter. Commuter air carriers as defined by CAB are operators who perform, pursuant to published schedules, at least five round trips per week between two or more points, or carry mail.

AD-A014 057/4GA PC$4.25/MF$2.25
Dunlap and Associates Inc Inglewood Calif Western Div
The Effect of Lighted Deck Shape on Night Carrier Landing.
Final rept.,
Joseph W. Wulfeck, and John E. Queen. Jun 75, 55p
Contract N00014-72-C-0041
See also report dated Oct 74, AD/A000 486.

Descriptors: *Carrier landings, *Night landings, *Visual acuity, Performance(Human), Performance tests, Errors, Ship decks, Horizontal orientation, Test methods, Illumination, Shape, Illusions, Glide slope, Landing aids, Visual aids, Simulation, Closed circuit television, Display systems, Test equipment.
Identifiers: *Lighted deck shape.

The primary purpose of the experimental program reported was to explore the possibility of identifying a tunnel lighted deck shape which would minimize errors in judging it to be horizontal. The secondary purpose was to compare errors in judgment of the horizontal between direct viewing and TV viewing. Preliminary, main and 'check' experiments were conducted to establish the relation between generated glideslope (error in judging simulated lighted carrier deck shapes to be horizontal) and lighted deck shape.

NTIS/PS-75/671/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Collision Avoidance Systems (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Guy E. Habercom, Jr. Aug 75, 203p*
Supersedes NTIS/PS-75/036.

Descriptors: *Bibliographies, *Collision avoidance, Accident prevention, Air transportation, Highway transportation, Marine transportation, Aviation safety, Marine safety equipment, Warning systems, Safety engineering, Abstracts.

Collision avoidance systems in three modes of transportation (i.e. air, surface, marine) are researched in these Government-sponsored reports. Section 1 pertains to air transportation. Traffic scheduling, automatic ground based stations, and onboard warning systems are researched. (Contains 158 abstracts) Section 2 delineates sensors and detectors relative to marine transportation collision avoidance. (Contains 19 abstracts) Section 3 relates to engineering research relative to highway and rail collision avoidance. (Contains 21 abstracts)

N75-25895/4GA PC$3.75/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Aerodynamik.
Aspects of German Research in Civil Aeronautics.
F. Thomas. 1975, 27p DLR-MITT-75-03
Conf-Presented at the Ann. Dfvlr Meeting, Munich, 7 Nov. 1974.
In German; English Summary.

Descriptors: *Civil aviation, *Germany, *Research, Cost effectiveness, Energy technology, Environment effects, Growth.

For abstract, STAR 1317

PATENT-3 887 233 Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Shoulder Harness and Lap Belt Restraint System.
Patent.
A. P. Garavaglia, and D. S. Matsuhiro. Patented 3 Jun 75, 4p PAT-APPL-452 767
Misc-Filed 19 Mar. 1974 Supersedes N74-18805 (12 - 10, p 1137).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Harnesses, *Safety devices, *Seat belts, Aircraft safety, Automobile accidents, Human factors engineering, *Patents.
Identifiers: PAT-CL-297-389.

A shoulder harness and lap belt restraint system are provided where the lap belt is combined with the shoulder harness so that a single fastening secures both the shoulder strap and the lap belt.

PB-244 223/4GA PC$3.75/MF$2.25
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
Aircraft Accident Report USAF Convair VT-29D (CV-340) and Cessna 150H, N50430 Newport News, Virginia January 9, 1975.
18 Jun 75, 31p NTSB-AAR-75-10, File-3-0001

Descriptors: *Aviation accidents, *Accident investigations, Level flight, Aircraft collisions, Casualties, Damage, Ground control approach radar, Flight maneuvers, Visual navigation.
Identifiers: Cessna 150 aircraft, DOT/5A, DOT/4DZ/DA, Convair 340 aircraft.

About 1836 e.s.t., on January 9, 1975, a United States Air Force Convair VT-29D (CV-340) and a Cessna 150H collided in flight over the James River near Newport News, Virginia, at an altitude of 1,500 feet. The five crewmembers and two passengers aboard the Convair and the pilot and passenger aboard the Cessna were killed. Both aircraft were destroyed by the collision and subsequent impact with the water. The Convair was executing a precision radar approach to Langley Air Force Base and was under the control of the Langley Ground Control Approach final controller. The Cessna was on a local pleasure flight; it was operating in accordance with visual flight rules, and was not on a flight plan. The National Transportation Safety Board determines that the probable cause of this accident was the human limitation inherent in the see-and-avoid concept, which can be critical in a terminal area with a combination of controlled and uncontrolled traffic.

PB-244 224/2GA PC$3.25/MF$2.25
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
Aircraft Accident Report Federal Aviation Administration Douglas DC-3C, N6 DuBois, Pennsylvania March 27, 1975.
25 Jun 75, 24p NTSB-AAR-75-11, File-3-0288

Descriptors: *Aviation accidents, *Accident investigations, Takeoff, Judgement, Pilots, Passenger aircraft, Collision research, Civil aviation.
Identifiers: DC-3 aircraft, DOT/5A, DOT/4DZ/DA.

About 1435 e.d.t., March 27, 1975, a Federal Aviation Administration Douglas DC-3 crashed during takeoff on the DuBois-Jefferson County Airport, DuBois, Pennsylvania. The three cockpit occupants and one passenger were seriously injured. The other seven cabin occupants sustained minor injuries. The aircraft was destroyed. The pilot, inexperienced and unqualified in the DC-3, was making the takeoff with a 7-knot crosswind and with an unlocked tailwheel. The National Transportation Safety Board determines that the probable cause of the accident was loss of control at takeoff because of the inexperience of the unqualified pilot making the takeoff and because of the failure of the experienced pilot in the right seat to assume timely control.

1C. Aircraft

AD-A013 588/9GA PC$5.25/MF$2.25
Systems Technology Inc Hawthorne Calif
Identification of Minimum Acceptable Characteristics for Manual STOL Flight Path Control. Volume II. STOL Aircraft Characteristics and Generic Model.
Final rept.,
Samuel J. Craig, Wayne F. Jewell, and Robert L. Stapleford. Jul 75, 101p Rept no. STI-TR-1035-3R-II FAA-RD-75-123-2
Contract DOT-FA73WA-3276

Descriptors: *Flight control systems, *Short takeoff aircraft, *Manual operation, Performance, Maneuverability, Stability, Dynamic response, Flight paths, Problem solving, Mathematical models, Lift, Simulation, Augmentation, Reviews.
Identifiers: Minimum requirements.

This report contains an overview of the fundamental aspects of manual flight path control as they relate to existing STOL aircraft concepts. The interrelationship between performance capability, represented for example by the glide slope polar, and path dynamic stability and control are identified. Several examples of path control problems are illustrated to substantiate the analytical discussion. A review of contemporary STOL propulsive lift concepts is given and the design features including augmentation aspects affecting manual path control are examined briefly. A mathematical model is defined which is suitable for simulation of flight path properties of the various STOL concepts.

AD-A013 592/1GA PC$5.75/MF$2.25
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
A-3B Series Aircraft Structural Fatigue Life Monitoring Program.
Final rept.,
Gene L. Barndt. 15 Jun 75, 138p Rept no. NADC-75035-30

Descriptors: *Airframes, *Antisubmarine aircraft, *Data processing, *Fatigue(Mechanics), Life expectancy, Mathematical prediction, Magnetic tape, Automatic, Flight, Time, Aircraft landings, Catapults, Mission profiles, Tables(Data).
Identifiers: Structural Fatigue Life, A-3B Aircraft, A-3 Aircraft.

This report provides detailed information concerning the methodology required to establish a program that updates, through automatic data processing, the structural fatigue life status of A-3B series aircraft on an individual BUNO basis. (Author)

AD-A013 768/7GA MF$2.25
Boeing Computer Services Inc Seattle Wash
Boeing Airplane/Noise Performance Computer Program. Programmer's Manual.
Final rept.,
K. Bhatia, M. A. Jaeger, S. Johnson, and B. G. Williams. Dec 73, 727p Rept no. BCS-G0473 FAA-EQ-73-7-7
Contract DOT-FA73-WA-3254
See also AD-A012 385.
Availability: Available in microfiche only.

Descriptors: *Aircraft noise, *Computer programming, Manuals, Takeoff, Approach, Noise reduction, Noise pollution.
Identifiers: Boeing aircraft, DOT/5C, DOT/4DZ/DA, Noise abatement.

The document provides programmer information for the Boeing Airplane Noise/Performance Computer Program. The program calculates takeoff and approach profiles, including noise-abatement procedures, with output data for distance, height, speed, thrust, rate of climb, gradient deck angle, engine pressure ratio, rotor speed, and noise under the flight path in units of EPNdB and dB(A). Information provided includes program usage, subprogram description, program flow, and other information required by computer programmers for the operation, maintenance, and modification of the program. Appendixes include data tables, data table source, sample run, and complete program listing.

AD-A013 788/5GA PC$4.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Motions of a Payload on a Tethered, Aerodynamic-Shape Balloon Using Various Cable Lengths.
Instrumentation papers,
Don E. Jackson, and Catherine B. Rice. 17 Mar 75, 60p Rept nos. AFCRL-IP-229, AFCRL-TR-75-0148

Descriptors: *Balloons, *Tethering, *Flight testing, Cables, Payload, Motion, Wind, Altitude, Test methods, Displacement, Damping, Trajectories, Length, Telemeter systems, Tension, Pitch(Inclination).
Identifiers: Tethered balloons.

A series of flight tests of a classic British barrage (kite) balloon was made at White Sands Missile Range in a variety of wind conditions and tether lengths. The report presents the motions of a payload suspended beneath the balloon as measured by ground-based cinetheodolites and balloon-borne sensors. Included in the data are horizontal and vertical trajectories, maximum displacement, pitch and roll angles, ground speed, and acceleration.

AD-A013 796/8GA PC$7.25/MF$2.25
Instrument Flight Center Randolph AFB Tex
Pilot Factors for Helicopter Refined ADI/HSI and Supporting Displays Evaluation.
Final rept.,

Gerald C. Armstrong, J. W. McCowell, Donald D. Sams, and F. J. Winter, Jr. Jun 75, 209p Rept no. IFC-TR-74-5
See also AD-A009 839.

Descriptors: *Helicopters, *Flight instruments, *Instrument flight, Pilots, Performance tests, Flight testing, Questionnaires, Display systems, Maneuvers, Acceptability, Assessment.
Identifiers: Attitude director indicators, Horizontal situation indicators.

This investigation was conducted to document pilot acceptance of improved displays for the standard light helicopter. Twenty-one helicopter pilots were given a technical briefing on the new displays and filled out a preflight questionnaire concerning their firsthand impressions. Sixteen of the twenty-one pilots received a familiarization flight with the new displays and filled out a postflight questionnaire giving their judgments and opinions. Five of the sixteen pilots were used as data collection pilots. These pilots flew profiles representing typical helicopter instrument maneuvers. Objective and subjective data were obtained through the use of video, audio, and oscillograph recording equipment.

AD-A013 837/0GA PC$5.25/MF$2.25
Uniroyal Tire Co Detroit Mich
Radial Ply Aircraft Tires - Design, Construction, and Testing.
Final rept. Dec 68-Jan 75,
C. G. W. Spinti, J. J. Licus, D. J. Martin, and J. S. Wagner. Jun 75, 113p ASD-TR-75-23
Contract F33657-68-C-1292

Descriptors: *Aircraft tires, Construction, Test methods, Treads, Dynamic tests.
Identifiers: Radial ply tires, Design, Evaluation.

The object of the program was to develop basic, general, radial ply aircraft tire design parameters and construction techniques. Four (4) sizes of aircraft tires, 20x4.4/12, 30x8.8/22, 44x16/28 and 20.00-20/22 P.R. were selected for the study. A summary report of the literature survey and a design manual were issued for Phase I. A total of 81 tires were built of which 49 were tested. One 20x4.4/12 P.R. tire with revised tread shoulder configuration completed 200 mph qualification testing but the result could not be duplicated. Best performance was obtained on the 44x16/28 P.R. tires. An 8 actual ply 3 breaker tire completed 200 mph qualification testing. The principle mode of failure on dynamic tests was separation between the tread and breakers. Variations in the tread, breaker construction to improve dynamic performance were tested.

AD-A013 841/2GA PC$3.75/MF$2.25
Illinois Univ At Urbana-Champaign Savoy Aviation Research Lab
Pilot Performances and Preferences with a Performance Control System.
Interim scientific rept.,
Craig Alan Bergman. Apr 75, 43p Rept no. ARL-75-5/AFOSR-75-2 AFOSR-TR-75-1186
Contract F44620-70-C-0105

Descriptors: *Flight control systems, *Human factors engineering, Performance, Pilots, Flight testing, Flight speeds, Angular motion, Comparison, Aircraft equipment, Information processing, Ratings.
Identifiers: Preferences, Band angles(Aircraft), Vertical speed.

Pilot performance and preference measures were obtained for 12 pilots in actual flight operations using a twin-engine general aviation aircraft with either conventional controls or a Performance Control System (PCS). The PCS provides a zero-order control of aircraft bank angle and vertical speed over the ranges of plus or minus 60 deg and plus or minus fpm, respectively. An information processing side-task was also used. With the PCS, flight error scores were reliably lower than with conventional aircraft controls. Pilot preferences, using a six-point scale ranging from 'slight' to 'moderate' to 'strong' preference for each of the two control systems, showed a 'moderate preference for the PCS' as the median response.

AD-A013 846/1GA PC$4.75/MF$2.25
IBM Federal Systems Div Gaithersburg Md
Program Documentation for the All Digital Cockpit Display System Programs,
W. E. Brandt, Jr. Jul 74, 88p AMRL-TR-74-145, AMRL-HESS-74-3
Contract F33615-72-C-1378

Descriptors: *Jet fighters, *Cockpits, *Display systems, *Interactive graphics, Computer programming, Computerized simulation, Flight control systems, FORTRAN.
Identifiers: *Operating systems(Computers), IBM 360/40 computers, FORTRAN 4 programming language.

The All Digital Cockpit Display (ADCD) System Programs were written for the Systems Effectiveness Branch (HES), Human Engineering Division, Aerospace Medical Research Laboratory (AMRL). The overall function of the entire system of programs is to provide a means for studying displays portraying information presently displayed on instruments in the cockpit of a single seated fighter aircraft, and to collect and analyze output data from simulated missions. The system uses an IBM 2250 Display Unit to generate displays that simulate the aerodynamic status, engine status, and navigation status of an aircraft as it would appear during flight. This system was written for an IBM System/360, Model 40 Computer. Both assembler language and FORTRAN IV were used in coding the subroutines and the Graphic Programming Services for the 2250 were used for the graphics software support. An IBM 1827 Data Control Unit is used as an interface between the computer and the controls of the simulated fighter aircraft.

AD-A013 847/9GA PC$5.25/MF$2.25
IBM Federal Systems Div Gaithersburg Md
Program Documentation for the RPV-AUTO Simulation Program,
D. L. Wartluft. Jan 75, 104p AMRL-TR-75-21, AMRL-HESS-75-1
Contract F33615-72-C-1378

Descriptors: *Remotely piloted vehicles, *Flight control systems, *Computerized simulation, Human factors engineering, Display systems, FORTRAN, Computer programming, User needs, Computer graphics.
Identifiers: FORTRAN 4 programming language, IBM 360/40 computers.

The RPV-AUTO Simulation Program is a real-time, interactive, graphics simulation of a hypothetical drone control facility. Its function is to provide a means for analyzing the effects of numerous variables on the operator performance of a five-man team whose task is to control 35 Remotely Piloted Vehicles through the enroute, terminal, and return phases of a simulated strike mission. The enroute and return phases are performed by four operators seated at IBM 2250 Display Units. The terminal phase is simulated by a single operator who controls a remotely located terrain table using a joy stick and TV receiver. Control of the terrain table is maintained by the program through an IBM 1827 Data Control Unit. The RPV-AUTO Simulation Program contains all of the features available in the original RPV Simulation Program previously developed by IBM personnel under this same contract. In addition, the RPV-AUTO Program contains an automatic flight plan 'auto-Patch') capability and a position report (PR) smoothing capability to aid the enroute operators in performing their task.

AD-A013 861/0GA PC$4.75/MF$2.25
Army Aviation Engineering Flight Activity Edwards AFB Calif
Evaluation of an OH-58A Helicopter with an Allison 250-C20B Engine.
Final rept. 17 Oct-6 Dec 74,
Tom P. Benson, Robert M. Buckanin, Carl F. Mittag, and James E. Jenks, Jr. Apr 75, 83p Rept no. USAAEFA-74-48
See also AD-907 291.

Descriptors: *Helicopter engines, *Helicopters, Flight testing, Hovering, Ceiling, Handling, Compatibility, Human factors engineering, Pilots, Performance(Engineering), Turboshaft engines, Vibration, Cooling, Temperature, Climbing, Acceleration, Horizontal orientation, Vertical orientation, Airframes.
Identifiers: OH-58A Helicopters, H-58 Helicopters, Allison 250-C20 Engines, T-63-A-700 Engines.

The United States Army Aviation Engineering Flight Activity conducted a limited performance and handling qualities evaluation of a Bell Helicopter Company OH-58A helicopter with an Allison 250-C20B engine installed. The evaluation was conducted at Edwards Air Force Base and Bishop, California, from 17 October through 6 December 1974. Twenty-two flights with 17.6 productive test hours were required for the evaluation. Test results obtained with the Allison 250-C20B engine were compared with those previously obtained with the Allison 250-C20 engine and the standard T63-A-700 engine. Primary performance improvement over the standard T63-A-700 engine was an increase in out-of-ground-effect hover ceiling from 4600 to 11,050 feet standard-day density altitude at a gross weight of 3000 pounds. One deficiency and five shortcomings were noted. Unsatisfactory handling qualities characteristics are inherent to the basic OH-58A helicopter and are not associated with the installation of the 250-C20B engine. The engine/airframe compatibility characteristics (cooling and vibration levels) of the OH-58A helicopter with the 250-C20B engine are similar to the standard OH-58A helicopter with the T63-A-700 engine. Within the scope of the test, the performance of the OH-58A helicopter with an Allison 250-C20B engine installed was improved over the basic OH-58A helicopter. Handling qualities were essentially unchanged.

AD-A013 918/8GA PC$4.75/MF$2.25
National Aviation Facilities Experimental Center Atlantic City N J
Investigation of Factors Influencing Propeller Blade Failures.
Final rept. Jan 71-Jul 74,
Marvin J. Walker. Jul 75, 86p Rept no. FAA-NA-75-1 FAA-RD-75-84

Descriptors: *Propellers(Aerial), *Propeller blades, Failure(Mechanics), Stresses, Fatigue life, Flight testing, Data acquisition.
Identifiers: *Failure analysis, DOT/4DZ/DA, *General aviation aircraft.

A flight and ground test program was conducted to examine vibratory and steady propeller blade operating stresses occurring in normal and transient abnormal operation of several types of reciprocating engine powered general aviation aircraft. The objectives of the tests were to evaluate such stresses as a possible cause of early propeller blade fatigue failure and to determine whether they were inherent in the characteristics of the engine-propeller combinations, or attributable to such factors as tolerance spread between identical models or accumulated time in service. The results also were considered in respect to current design and certification standards.

AD-A013 926/1GA PC$4.75/MF$2.25
Calspan Corp Buffalo N Y

Flight Investigation of Fighter Side-Stick Force-Deflection Characteristics.
Final rept. Sep 74-May 75,
G. Warren Hall, and Rogers E. Smith. May 75, 93p Rept no. CALSPAN-AK-5280-F-8 AFFDL-TR-75-39
Contract F33615-73-C-3051
See also report dated Oct 74, AD-A011 726.

Descriptors: *Flight control systems, *Control sticks, *Fly by wire control, Command and control systems, Flight simulation, Force(Mechanics), Deflection, Maneuverability, Experimental design, Research planes, Jet fighters, Electrical networks.
Identifiers: Side stick onctrollers, NT-33A aircraft, T-33 aircraft.

A flight investigation of fighter side-stick controller force-deflection characteristics was performed using the USAF NT-33A variable stability airplane equipped with a variable feel side stick. The simulated airplane and control system characteristics were representative of a modern high performance fighter employing a side-stick controller. Up-and-away tasks including formation, air-to-air tracking and acrobatic maneuvering, and landing approach tasks were evaluated by two pilots. Four values of nonlinear pitch and roll side-stick force-command gain resulting in different response per force ratios were evaluated with different side-stick force-deflection gradients, including a rigid side stick.

N75-25916/8GA PC$4.25/MF$2.25
Douglas Aircraft Co., Inc., Long Beach, Calif.
Engine/Airframe Compatibility Studies for Supersonic Cruise Aircraft.
May 75, 59p NASA-CR-132610-1, MDC-J4505-SUPPL
Contract NAS1-13229

Descriptors: *Aircraft configurations, *Engine design, *Supersonic aircraft, Aircraft production, Turbine engines, Turbofan engines.

For abstract, STAR 1317

N75-25918/4GA PC$8.50/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Design of Aircraft Wheels and Brake Systems.
I. I. Zverev, and S. S. Kokonin. Jun 75, 260p NASA-TT-F-15764
Contract NASW-2483
Tran-Transl. Into English of the Book "Proyektirovaniye Aviatsionnykh Koles I Tormoznykh Sistem" Moscow, Mashinostroyeniye Press, 1973 224 p.

Descriptors: *Aircraft brakes, *Aircraft tires, *Vehicle wheels, Aircraft design, Aircraft parts, Antiskid devices, Wheel brakes.

For abstract, STAR 1317

N75-25961/4GA PC$4.25/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Abteilung Luftfahrtpsychologie.
Cockpit-System Study Yak 40. A Pilot Opinion Survey to the Aircraft Handling and System Qualities.
K. Steininger, and G. Neumann. 2 Jan 75, 72p DLR-FB-75-15
Subm-Sponsored by Bundesmin. Fuer Verkehr. In German; English Summary.

Descriptors: *Aircraft performance, *Aircraft pilots, *Cockpits, *Controllability, *Yak 40 aircraft, Aircraft control, Aircraft instruments, Airline operations, Assessments, Performance tests, Ratings, Short haul aircraft.

For abstract, STAR 1317

N75-26693/2GA PC$5.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
A Computer Program for Fitting Smooth Surfaces to an Aircraft Configuration and Other Three Dimensional Geometries.
C. B. Craidon. Jun 75, 112p NASA-TM-X-3206, L-9934

Descriptors: *Aircraft configurations, *Computer programming, *Surface roughness, *User manuals (Computer programs), Cathode ray tubes, Input/output routines, Subroutines.

For abstract, STAR 1317

PATENT-3 161 272 Not available NTIS
Department of the Army Washington D C
Self-Energizing Clutch.
Patent,
Robert J. Malchodi. Filed 3 May 62, patented 15 Dec 64, 5p Rept nos. PAT-APPL-192 294,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Aircraft canopies, *Clutches, *Patents, Drive shafts, Cams, Solenoids.
Identifiers: PAT-CL-192-74.

This invention relates to a clutch mechanism and more particularly concerns such a device which is self-energized upon rotation of the power drive shaft and releasable by solenoid action.

PATENT-3 884 432 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
High Lift Aircraft.
Patent.
W. S. Blanchard, Jr., and J. L. Johnson, Jr..
Patented 20 May 75, 6p PAT-APPL-367 268
Misc-Filed 5 Jun. 1973 Supersedes N73-26007 (11-17, p 1980).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Aerodynamic stability, *Aircraft control, *Aircraft design, *Lift devices, Aircraft stability, Noise reduction, *Patents, Stability derivatives.
Identifiers: PAT-CL-244-15.

An aerodynamically balanced high-lift aircraft is proposed in which the problems of large nose-down pitching moments generated by the flap high-lift forces, the loss of trim lift during high-lift flight and the yawing moments caused by the loss of an engine are solved without the use of large horizontal and vertical tails. A wing is carried by and bounced on the tips by spaced-parallel fuselages; horizontal tails are mounted only onto the outboard surfaces of the wing-tip fuselages, the centroid-of-lift of the high-lift flaps is located substantially at the center of gravity of the aircraft and the exhausts of the engines are emitted in the vertical plane of symmetry of the aircraft. Yawing moments occurring during flight with an engine inoperative are reduced; the horizontal tails carry an upload and contribute positive trim lift; large nose-down pitching moments generated by the high-lift flaps are minimized and noise levels are reduced.

1D. Aircraft Flight Control and Instrumentation

AD-A013 994/9GA PC$4.25/MF$2.25
National Aviation Facilities Experimental Center Atlantic City N J
Evaluation of Digital Altimeter Setting Indicators.
Final rept. Oct 72-Sep 73,
Robert Frack, Ernest E. Schlatter, and Jack Bernstein. Aug 75, 55p Rept no. FAA-NA-74-46 FAA-RD-75-81

Descriptors: *Altimeters, *Air pressure, *Detectors, Test methods, Barometers, Comparison, Electronic equipment, Accuracy, Temperature, Voltage, Stability, Display systems, Feasibility studies.
Identifiers: Warmup(Instruments), DOT/4IZ/IC.

Altimeter setting values disseminated to the pilot are currently obtained from nonelectronic (aneroid) dial and pointer indicators. Electronic systems with potential for continuous sensing of ambient atmospheric pressure and subsequent conversion to altimeter setting values and remoting to multiple digital displays were tested for warmup, accuracy, temperature, line voltage, and stability. Data on the results obtained and the test procedures are presented.

1E. Air Facilities

AD-A013 593/9GA PC$3.75/MF$2.25
Naval Air Engineering Center Lakehurst N J Engineering Dept (Si)
E-28 Arresting Gear Purchase Tape Service Life Extension.
Interim rept. May 70-Jun 75,
John Drulle. 8 Aug 75, 26p Rept no. NAEC-ENG-7879

Descriptors: *Arresting gear, *Naval procurement, Tapes, Landing aids, Replacement, Costs, Nylon, Aviation safety, Life expectancy, Tensile properties, Strength(Mechanics).
Identifiers: E-28 arresting gear, *Nylon arresting gear purchase tape.

This report presents a study of tensile test data obtained from E-28 Arresting Gear purchase tapes which had been granted service life extensions in field use. The results of this study show that in certain cases the service life can be increased. (Author)

AD-A013 681/2GA PC$5.25/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
Nondestructive Vibratory Testing of Airport Pavements. Volume II: Theoretical Study of the Dynamic Stiffness and Its Application to the Vibratory Nondestructive Method of Testing Pavements.
Final rept.,
Richard A. Weiss. Apr 75, 111p FAA-RD-73-205-2
Contract FA-71-WAI-218

Descriptors: *Landing fields, *Pavements, Airports, Vibrators(Machinery), Dynamic loads, Deflection, Stiffness.
Identifiers: DOT/4CZ/CA.

A theoretical and experimental study of the dynamic load-deflection curves of pavements was conducted to determine the dependence of the measured dynamic stiffness values of a pavement on the type of vibrator that is used to make the measurements, and to correlate dynamic stiffness measurements obtained from different vibrators at the same pavement loca-

tion. Experimental tests were conducted to verify the theoretical results. The dynamic load-deflection curves of pavements are found to be nonlinear, and a nonlinear vibration theory of pavements is developed to describe these curves. This study gives a method of determining the shear modulus and thickness of each pavement layer directly from the measured values of dynamic stiffness for a series of vibrator baseplate sizes. This method may be of practical value for nondestructively determining the subsurface structure of a pavement.

AD-A013 725/7GA PC$3.75/MF$2.25
Aeronautical Systems Div Wright-Patterson AFB Ohio
USAF Skid Resistance Programs - A Status Summary,
William V. Tracy, Jr. Mar 75, 34p Rept no. ASD-TR-75-14
See also report dated May 75, AD-A012 003.

Descriptors: *Pavements, *Runways, *Skidding, Air force operations, Landing fields, Grooving, Cost effectiveness, Predictions, Traction, Concrete, Stopping, Flight testing, Reviews.
Identifiers: Hydroplaning, Skid resistance.

The report is a status summary of the USAF Skid Resistance Programs. Numerous programs have been conducted within the USAF and by joint USAF, FAA, and NASA agreements. Pavement grooving appears to be the best deterrent to aircraft hydroplaning, but must be reviewed in a cost effective manner and at best is a long term solution. The AFCEC Skid Resistance and Hydroplaning Potential Runway Evaluation Program is excellent and is a short term solution, but in itself cannot correct runway deficiencies but only point out the most critical ones. The method of predicting aircraft stopping distance derived in Combat Traction II, Phase II is very promising but requires additional analytical verification and clarification along with flight testing.

AD-A013 920/4GA PC$7.50/MF$2.25
Battelle Columbus Labs Ohio
Impacts of Potential 1980's Aviation Technology on the Capacity of an Existing Airport.
Final rept.,
Vincent J. Drago. Mar 75, 238p TSC-FAA-AVP-75-1-Vol-2
Contract DOT-TSC-636
See also Volume 1 dated Mar 75, AD-A013 432.

Descriptors: *Airports, *Urban planning, Capacity(Quantity), Surveys, Forecasting, New York, New Jersey, Technology, Terminal flight facilities, Mathematical prediction, Environments, Impact, Configurations, Aircraft noise, Air traffic control systems, Air pollution, Runways, Waste disposal.
Identifiers: DOT/CZ/CE, DOT/CZ/CY.

This study was conducted to determine the impacts which potential 1980's advances in aviation technology might have on the capacity and surrounding environment of a high-density air carrier airport. New York's La Guardia Airport was chosen to illustrate these impacts. Actual 1972 airport operations, and anticipated 1985 airport operations are examined. Four advanced technology development alternatives were identified for the mid to late 1980's time frame. A detailed airport configuration plan was derived for the development alternatives which had the highest potential passenger capacity.

AD-A013 993/1GA PC$3.25/MF$2.25
National Aviation Facilities Experimental Center Atlantic City N J
Runway Surface Friction Changes Due to High-Pressure Water-Jet Rubber Removal, Charleston Airport, Charleston, South Carolina.
Interim rept. Jun 74-Jun 75,
William A. Hiering, and Charles R. Grisel. Aug 75, 21p Rept no. FAA-NA-75-4 FAA-RD-75-103

Descriptors: *Runways, *Skidding, *Cleaning, Rubber, Removal, Water jets, Efficiency, Friction, Pavements, Surface properties, Airports.
Identifiers: Charleston Airport, Charleston(South Carolina), DOT/4CZ/CA.

The study determined if the utilization of a new method of removing rubber deposits from an airport runway would change the surface friction of that runway. The method consisted of jetting water at high velocity to hydraulically remove the rubber from the surface. The results of these tests indicated that the equipment used by the runway-cleaning contractor did not damage the runway surface; however, it did not appreciably change the friction characteristics, probably due to the incomplete removal of all rubber deposits.

2. AGRICULTURE

2B. Agricultural Economics

PB-243 639/2GA PC$4.25/MF$2.25
Washington Univ., St. Louis, Mo. Center for the Biology of Natural Systems.
A Comparison of the Production, Economic Returns, and Energy Intensiveness of Corn Belt Farms That Do and Do Not Use Inorganic Fertilizers and Pesticides,
William Lockeretz, Robert Klepper, Barry Commoner, Michael Gertler, and Sarah Fast.
Jul 75, 68p* CBNS-AE-4
Grant NSF-GI-043890

Descriptors: *Farms, *Livestock, *Fertilizers, *Pesticides, *Agricultural economics, Corn plants, Production, Inorganic compounds, Pest control, Market value, Crop value, Correlation techniques, Probability theory, Regression analysis, Working time, Farm crops.
Identifiers: Corn Belt, *Organic farming.

The report compares crop production on a sample of 16 mixed crop-livestock farms in the Corn Belt on which no inorganic fertilizers and almost no pesticides are used, to that of a matched sample that uses conventional fertilization and pest control practices. In the 1974 crop year, the market value of the crops raised per acre was slightly higher on the conventional sample (an average of 8%), but this difference was not statistically significant at the 90% probability level. There was no difference between the two group's crop production returns, that is, value of production less operating costs. The energy intensiveness (defined as energy input divided by value of production) on the farms that do not use fertilizers is an average of one-third as much as that of the conventional group.

2C. Agricultural Engineering

N75-26476/2GA PC$4.75/MF$2.25
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
Yield Prediction by Analysis of Multispectral Scanner Data.
Final Report, 15 May 1974 - 14 Mar. 1975.
J. E. Colwell, and G. H. Suits. May 75, 82p
NASA-CR-141865, ERIM-109600-17-F
Contract NAS9-14123

Descriptors: *Crop growth, *Multispectral band scanners, *Remote sensors, *Yield, Earth resources, Forecasting, Grains (Food), Mathematical models, Vegetation, Wheat.

For abstract, STAR 1317

N75-26480/4GA PC$3.25/MF$2.25
Texas A&M Univ., College Station. Dept. of Mathematics.
Optimal Selection of Passes.
L. F. Guseman, Jr., and B. P. Marion. Jan 75, 19p NASA-CR-141877
Contract NAS9-13894

Descriptors: *Crop identification, *Landsat satellites, *Numerical analysis, Computer programs, Farm crops, Matrices (Mathematics).

For abstract, STAR 1317

PB-243 562/6GA PC$4.25/MF$2.25
Kansas Water Resources Research Inst., Manhattan.
Predicting Evapotranspiration from Agricultural Water Sheds Under Dry Conditions.
Project completion rept. 1 Jun 73-31 Aug 74,
Jerome J. Zovne, and Ahmad Nawaz. May 75, 72p Contrib-164 W75-09860, OWRT-A-050-KAN(1)
Contract DI-14-31-0001-3516

Descriptors: *Streamflow, *Farms, *Evapotranspiration, Black Vermillion Watershed, Meteorological data, Runoff, Mathematical models, Hydrology, Soil water, Evaporation, Ground water, Surfaces, Growth, Transpiration, Rainfall, Kansas.

A new evapotranspiration (ET) function for the Kansas Water Budget model is developed and tested on the Black Vermillion watershed in Northeastern Kansas. The purpose of the new ET function is to improve the response of Kansas model to daily climatic changes and to the distribution and stage of growth of crops on an agricultural watershed. The new function uses the Penman Combination equation modified by three coefficients which account for (1) the soil moisture availability, (2) the incrased soil surface evaporation following rainfall, and (3) for the crop transpiration efficiency which varies with the crop and the stage of growth. The new function was programmed into the present Kansas model and both the present and revised models were applied to the Black Vermillion for comparison purposes.

PB-243 593/1GA PC$7.50/MF$2.25
Wisconsin Univ., Madison. Dept. of Mechanical Engineering.
Mechanical Management of Aquatic Vegetation: Analytical Studies of Unit Operations Potentially Useful in Their Processing.
Doctoral thesis,
Se Hiong Sy. 1974, 238p W75-09861, OWRT-B-078-WIS(1)
Contract DI-14-31-0001-3947

Descriptors: *Aquatic weeds, *Dewatering, Harvesting, Weed control, Mulching, Feeding stuffs, Livestock, Moisture content, Separation, Forage crops, Pressure, Theses, Recovery, Wisconsin.
Identifiers: Dane County(Wisconsin).

Dewatering processes and solid-liquid separation methods applied to harvested aquatic vegetation as an aid to handling and/or utilizing it are described. An 'initiation pressure' was defined and was shown to be a useful quantitative parameter indicative of the ease of dewatering aquatic vegetation. Subsequent use of this parameter improved the validity of a moisture predicting function. For the case of constant pressure dewatering, two separate mechanisms were observed (1) a short 'initial rate' period and (2) a 'falling rate' period characterized by a slow decay in the rate of moisture expression. The chemical composition and variations in composition of Eurasian watermilfoil were investigated. Peak crude protein content was only slightly lower than

that of alfalfa. Calcium and xanthophyll contents were high and crude fiber low relative to forage crops.

PB-243 749/9GA PC$7.50/MF$2.25
Geological Survey, Tacoma, Wash. Water Resources Div.
Water Resources of the Toppenish Creek Basin, Yakima Indian Reservation, Washington.
Final rept.
Oct 74, 249p USGS/WRI-42-74, USGS/WRD-75/044
Prepared in cooperation with Yakima Tribal Council, Wash.

Descriptors: *Irrigation, *Toppenish Creek Basin, *Water supply, *Yakima River, Irrigation canals, Water flow, Aquifers, Water wells, Ground water, Basalt, Seepage, Water table, Sources, Washington(State), Nomographs.
Identifiers: Yakima Indian Reservation, Water levels.

About 94%, or 655,000 acre-feet per year, of water used for irrigation in the Toppenish Creek basin of the Yakima Indian Reservation is diverted from the Yakima River, the eastern boundary of the reservation. The flows of Toppenish Creek and its tributaries are small in comparison, but they are vital to irrigation of areas upslope from the irrigation canals. About 17.5 acre-feet per year of ground water from a basalt aquifer and about 3.5 acre-feet per year from young and old valley-fill aquifers also are used for irrigation in the basin. Each aquifer is capable of yielding more than 1000 gallons per minute to efficiently constructed wells. The young valley fill aquifer in the eastern part of the basin is the best source of ground water.

TID-26780 PC$4.00/MF$2.25
Tennessee Valley Authority, Muscle Shoals, Ala.
Using Power Plant Discharge Water in Greenhouse Vegetable Production. Progress Report.
C. E. Madewell, L. D. King, J. Carter, J. B. Martin, and W. K. Furlong. Jan 75, 18p

Descriptors: (*Nuclear power plants, *Waste heat), (*Greenhouses, *Design), Crops, Cucumbers, Economics, Environmental engineering, Growth, Lettuce, Liquid wastes, Pilot plants, Seasonal variations, Temperature dependence, Tomatoes, Vegetables.

For abstract, see NSA 32 03, number 06469.

2D. Agronomy and Horticulture

JPRS-65132 PC$3.75/MF$2.25
Joint Publications Research Service, Arlington, Va.
Provisional Recommendations for the Use of Herbicides on Grain Plantings,
T. A. Ishchenko. 2 Jul 75, 30p
Trans. of mono. Vremenye Rekomendatsii po Primeneniyu Gerbitsidov na Posevakh Zernovykh Kultur, Moscow, 1973 p1-33.

Descriptors: *Herbicides, *Grain crops, Cultivation, Soil properties, Weed control, Vegetation, Dose rate, Toxicity, Recommendations, Translations, USSR.

The report contains provisional recommendations for the use of herbicides on grain plantings.

NTIS/PS-75/668/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Agricultural Resources Surveys (A Bibliography with Abstracts).
Rept. for Oct 73-Aug 75,
Audrey S. Hundemann. Aug 75, 86p*
Supersedes NTIS/PS-75/068.

Descriptors: *Agriculture, *Bibliographies, Vegetation, Farm crops, Ground cover, Forestry, Land use, Mapping, Natural resources, Remote sensing, Spaceborne photography, Scientific satellites.
Identifiers: ERTS satellites.

The research covered deals with results of remote sensing techniques for crop identification, acreage measurement, land mapping, and forest density. A small number of abstracts pertain to identification of plant diseases and insect pests and fishery resource assessment. (Contains 81 abstracts)

ORO-2410-33 PC$5.75/MF$2.25
North Carolina State Univ., Raleigh Dept. of Soil Science.
Nitrate Absorption and Strontium Accumulation. Annual Progress Report, 1 August 1974--31 July 1975.
W. A. Jackson. Apr 75, 53p
Contract AT(40-1)-2410

Descriptors: (*Maize, *Metabolism), (*Nitrates, *Root absorption), (*Strontium, Root absorption), Response modifying factors, Seedlings.

No abstract available.

PB-243 442/1GA PC$3.75/MF$2.25
National Academy of Sciences, Washington, D.C.
The Winged Bean; A High-Protein Crop for the Tropics.
1975, 50p
Contract AID/csd-2584

Descriptors: *Leguminous plants, *Food, Nutritive value, Proteins, Oils.

Edible legumes are excellent sources of dietary protein and oils. Many nutritionists expect them to play an increasing role in meeting food needs in this time of food shortages and widespread malnutrition. In addition to the major cultivated edible legumes--soybeans, peanuts (groundnuts), peas, and beans--there are more than 50 minor tropical legumes that have received little scientific attention (mainly because researchers have concentrated on more conventional crop species, especially cereals). This report focuses on the exceptional promise offered by one of these: the winged bean.

2E. Animal Husbandry

PB-243 409/0GA PC$3.75/MF$2.25
Washington Univ., St. Louis, Mo. Center for the Biology of Natural Systems.
Agricultural Resources Consumed in Beef Production,
William Lockeretz. Jun 75, 48p* CBNS-AE-3
Grant NSF-GI-043890

Descriptors: *Beef, *Irrigation, *Fertilizers, *Feeding stuffs, Farm crops, Water supply, Production, Food consumption, Natural resources, Arid land, Forage grasses, Proteins, Food supply, Wheat plants, Soybean plants, Correlation techniques.

The consumption of energy, fertilizer, water, and cropland has been calculated for nine different beef production systems. These systems vary with respect to region, type of pasture and cropland, and feeding program. Among the nine systems, there is a considerable range of resource intensiveness, depending on factors such as type of pasture, type of cropland (irrigated vs. dryland) and kinds of roughages and protein supplements. Data are also presented on the consumption of the same resources in the production of wheat and soybeans in the same regions, on comparable land to that used to raise cattle feeds. In all cases, the resource consumption for beef is very much greater than for a wheat/soybean mixture of equivalent protein value.

PB-243 748/1GA PC$10.25/MF$2.25
Utah State Univ., Logan. International Feedstuffs Inst.
Guide for Estimating Toxic Residues in Animal Feeds or Diets,
Lorin E. Harris. Jan 75, 384p* EPA-540/9-75-019
Contract DI-68-01-2658

Descriptors: *Feeding stuffs, *Toxicity, *Pesticides, *Diets, Manuals, Beef cattle, Dairy cattle, Plants(Botany), Animal nutrition, Forage crops, Milk, Poultry, Horses, Sheep, Swine, Classifications, Drying, Forage grasses, Silage, Eggs, Fish protein concentrates, Food additives, Tables(Data).

The report is a tabulation developed to aid EPA pesticide petition reviewers in constructing typical animal diets for the purpose of estimating residues in meat/milk/eggs. The scope of the tabulation is to cover all feed components currently used in animal husbandry, the range of their percentage composition of commercial livestock diets, the physical state of the feed component as ingested (wet weight, dry weight), and limitations which might apply to the feeding practice (from economics of shipping, availability, etc.).

2F. Forestry

PB-243 372/0GA PC$3.75/MF$2.25
Lake States Forest Experiment Station, St. Paul, Minn.
The Timber Resource of North Dakota.
Forest Service station paper (Final),
John R. Warner, and Clarence D. Chase. Jul 75, 47p FSSP-LS-36

Descriptors: *Structural timber, *North Dakota, Inventories, Sawmills, Forest land, Swamps, Mountains, Volume, Hardwoods, Forest trees, Plant growth, Forestry, Mortality, Surveys, Tables(Data), Wood products.
Identifiers: Cottonwood trees, Aspen trees.

The report presents results of the first inventory of North Dakota's timber resource, as of 1954. Forests occupy 468 thousand acres in the State, of which 452 thousand acres are commercial forest. Lowland and upland forest types occupy about equal proportions of the forest area. Over two-thirds of the commercial area is privately-owned total volume of growing stock is 258 million cubic feet, practically all of which is in hardwood species. Cottonwood and aspen together account for nearly 40% of total growing stock volume. Growth of all growing stock exceeded cut by about 10% during 1954.

PB-243 703/6GA PC$9.25/MF$2.25
Environmental Protection Agency, Seattle, Wash. Region X.
Logging Roads and Protection of Water Quality.
Final rept.
Mar 75, 306p* EPA/910/9-75/007
Prepared in cooperation with Arnold, Arnold and Associates, Seattle, Wash., and Dames and Moore, Seattle, Wash.

Descriptors: *Forest land, *Roads, *Lumbering, *Water quality management, Reviews, Water pollution standards, Environmental protection, Design, Degradation, Construction, Maintenance, Deicers, Sources, Forest trees, Sediments, Chemical properties, Construction materials.
Identifiers: *Logging roads, Water pollution abatement, Silviculture.

This report is a state-of-the-art reference of methods, procedures and practices for including water quality consideration in the planning, design, construction, reconstruction, use and maintenance of logging roads. Most of the methodology also is applicable to other forest management roads. The report is divided into two parts. The first part provides general perspective on physical features and conditions in EPA region X which are relevant to water quality protection and logging roads. The second part outlines specific methods, procedures, criteria and alternatives for reducing the degradation of water quality. Topic coverage in this part includes road planning, design, construction and maintenance including the use of chemicals on roads. Silvicultural activities are one category of water pollution from nonpoint sources described in Public Law 92-500. Of all silvicultural activities, logging roads have been identified as the principal source of man-caused sediment.

PB-243 924/8GA PC$4.25/MF$2.25
Central States Forest Experiment Station, Columbus, Ohio.
The Forest Resources of Iowa.
Forest Service release (Final),
Philip L. Thornton, and James T. Morgan. Mar 59, 52p FSR-CS-22

Descriptors: *Structural timber, *Iowa, Inventories, Forest land, Farms, Volume, Plant growth, Oak trees, Maple trees, Cutting, Statistical data, Tables(Data), Surveys.
Identifiers: Cottonwood trees, Elm trees, Basswood trees.

The report presents results of the first inventory of Iowa's timber resource, as of 1954. Seven % of the State's land area is forested--about 2.6 million acres; practically all of it is commercial forest land. The State's eastern counties average about 12% forest land and the western counties about 3%. Farmers own 88% of the forest land. About one-fourth of the farms have some woodland, averaging 45 acres per farm. Growing stock volume is about 1.4 billion cubic feet, an average of 7 1/2 cords per acre. Sawtimber volume is 5.1 billion board feet, one-third in oaks, one-fourth in cottonwood, silver maple, and basswood, one-fifth in elms, and the remaining one-fifth in other species. Net growth on growing stock is about three times greater than timber cut.

3. ASTRONOMY AND ASTROPHYSICS

3A. Astronomy

AD-A014 077/2GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
The Julian Day Number for Any Gregorian Calendar Date after 1900.
Final rept.,
John A. Eisele, and Paul E. V. Shannon. Aug 75, 15p Rept no. NRL-MR-3100

Descriptors: *Astronomy, *Diurnal variations, *Computer programming, Computations, Conversion, Subroutines, FORTRAN.
Identifiers: *Julian day numbers, *Gregorian calendars.

Compact formulas and FORTRAN subprograms are presented to compute the Julian day number, day of the week, and modified Julian day number for any Gregorian calendar date. The inverse problem of recovering the Gregorian calendar date from a known Julian day number is also presented. Basic astronomical applications are discussed as well as the precision requirements.

3B. Astrophysics

AD-A013 776/0GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
A Model for the Solar Flare,
R. C. Canfield, E. R. Priest, and D. M. Rust. 10 Jul 75, 12p Rept no. AFCRL-TR-75-0367
Pub. in Proceedings of Conference at National Center for Atmospheric Research, Boulder, Colo., 23-25 Sep 74, p361-371.

Descriptors: *Solar flares, *Chromosphere, *Solar corona, Magnetic fields, Magnetic forces, Activation, Interactions.

It is suggested that many solar flares occur due to an interaction between newly emerging magnetic flux and an active region filament. A current sheet forms between the new and old flux and, when its electric current density exceeds a critical value, rapid magnetic fields reconnection takes place. Electrons are then accelerated to high energies and follow the magnetic field lines down to the chromosphere where they produce several (typically three) bright H alpha knots. Magnetic energy is continuously released as reconnected prominence fields are allowed to untwist. Two ribbons of H alpha emission are produced by one or more of three mechanisms: energetic particles, thermal conduction or shocks due to infalling material.

AD-A013 778/6GA PC$3.25/MF$2.25
Stanford Univ Calif Inst for Plasma Research
Force Free Magnetic Fields and Solar Activity.
Interim rept.,
P. A. Sturrock, and C. W. Barnes. Aug 74, 8p
Rept no. Scientific-1 AFCRL-TR-74-0521
Contract F19628-74-C-0054

Descriptors: *Solar Flares, *Chromosphere, Magnetic fields, Solar corona, Solar structure, Forecasting.
Identifiers: *Solar magnetic fields.

This report concerning the prediction of solar flares, centers on devising methods for calculating magnetic field structures in the solar atmosphere. Force-free fields comprise an important class of magnetic-field structures which may be calculated by relaxation techniques. Models of force-free fields with cylindrical symmetry, based on a spherical boundary surface, have been calculated. Evaluation of the energy of such structures provides information about the eruption of closed field patterns to form open current sheets which can then lead to solar flares.

AD-A014 024/4GA PC$3.25/MF$2.25
Iowa Univ Iowa City Dept of Physics and Astronomy
Pioneer 11 Observations of Energetic Particles in the Jovian Magnetosphere,
J. A. Van Allen, B. A. Randall, D. N. Baker, C. K. Goertz, and D. D. Sentman. 14 Mar 75, 7p
Contracts N00014-68-A-0196-0009, NAS2-5603
Availability: Pub. in Science, v188 p459-462, 2 May 75.

Descriptors: *Planetary atmospheres, *Jupiter(Planet), *Magnetosphere, Electrons, Protons, Space probes, Flyby, Energy levels, Reprints.
Identifiers: Pioneer 11 spacecraft.

Knowledge of the positional distributions, absolute intensities, energy spectra, and angular distributions of energetic electrons and protons in the Jovian magnetosphere has been considerably advanced by the planetary flyby of Pioneer 11 in November-December 1974 along a quite different trajectory from that of Pioneer 10 a year earlier. The previously reported magnetodisc is shown to be blunted and much more extended in latitude on the sunward side than on the dawn side. Rigid corotation of the population of protons E sub P is about 1 million electron volts in the magnetodisc is confirmed. Angular distributions of energetic electrons E sub c is > 21 million electron volts in the inner magnetosphere are shown to be compatible with the Kennel-Petschek whistler-mode instability. A diverse body of magnetospheric effects by the Jovian satellites is found. Observations of energetic electrons in to a radial distance of 1.59 Jovian radii provide a fresh basis for the interpretation of decimetric radio noise emission.

COM-75-11092/4GA PC$4.25/MF$2.25
National Oceanic and Atmospheric Administration, Boulder, Colo. Space Environment Lab.
Propagation and Detection of Turbulence Generated MHD Waves in the Lower Solar Atmosphere.
Technical memo.,
Stephen J. Mangis. Feb 75, 58p NOAA-TM-ERL-SEL-39 NOAA-75072307

Descriptors: *Solar atmosphere, *Magnetohydrodynamic waves, Turbulence, Solar flares, Wave equations, Numerical integration, Mathematical models.
Identifiers: Alfven waves.

Some basic solar concepts are developed and the limiting effects of the terrestrial atmosphere upon solar observations are investigated. Several theoretical aspects of MHD waves and the frequency spectrum of MHD waves generated by the hydrogen convection zone are discussed. The magnitudes of various observable characteristics of these waves are calculated, and there is a brief discussion of how its is hoped these characteristics can be observed. It is concluded that the visual changes caused by turbulence generated MHD waves are of sufficient magnitude to be observed by orbiting telescopes now being developed, but that more work needs to be done to determine exactly how and where to observe these changes.

COM-75-50193-370-1/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
Solar-Geophysical Data Number 370. Part I (Prompt Reports). Data for May 1975-April 1975. Explanation of Data Reports Issued as Number 366 (Supplement) February 1975,
Hope I. Leighton. Jun 75, 110p SGD-370-Pt-1
See also COM-75-50193-370-2.
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $34.00/year includes Part I (Prompt Reports) and Part 2 (Comprehensive Reports); $18.00/year for either part. Annual supplement containing explanation is included. $1.40/copy for either part; $1.30 for extra issue.

Descriptors: *Solar activity, Solar flares, Protons, Solar radio emission, Radio waves, Solar wind, Sudden ionospheric disturbances, Solar x rays, Solar cosmic rays, Geomagnetism, Magnetic storms, Tables(Data).
Identifiers: Pioneer 6 spacecraft, Pioneer 7 spacecraft, Pioneer 8 spacecraft, SMS-1 GOES satellite, Solar protons.

Prompt reports are given on data for May 1975 and April 1975. These deal with alert periods, daily solar indices, solar flares, solar radio waves, solar wind measurements, spacecraft observations, solar x-ray radiation, inferred IP magnetic field polarities, daily solar activity centers, sudden ionospheric disturbances, cosmic rays, geomagnetic indices, and radio propagation indices.

COM-75-50193-370-2/GA MF$2.25
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.

Solar-Geophysical Data Number 370. Part II (Comprehensive Reports). Data for December 1974-November 1974 and Miscellanea. Explanation of Data Reports Issued as Number 366 (Supplement) February 1975.
Hope I. Leighton. Jun 75, 33p SGD-370-Pt-2
NOAA-75072209
See also COM-75-50193-370-1.
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $34.00/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $18.00/year for either part. Annual supplement containing explanation is included. $1.40/copy for either part; $1.30 for extra issue.

Descriptors: *Solar activity, Solar flares, Solar radio emission, Radio waves, Magnetic storms, Cosmic rays, Tables(Data).

Comprehensive reports are given on data for December and November 1974. These deal with solar flares, solar radio waves, magnetograms of geomagnetic storms, abbreviated calendar record, and cosmic ray indices.

COO-3071-136 PC$4.00/MF$2.25
Pennsylvania Univ., Philadelphia Dept. of Physics.
Neutrino Cosmology.
S. A. Bludman. 1974, 15p

Descriptors: (*Cosmology, *Neutrinos), Antineutrinos, Chemical composition, Cosmic radiation, Coupling, Electrons, Energy, Gravitons, Helium 4, Leptons, Mass, Muons, Neutral currents, Photons, Protons, Reviews, Thermal analysis, Universe.

For abstract, see NSA 32 03, number 07367.

N75-26002/6GA PC$5.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Feasibility of an Infrared Astronomy Satellite Experiment Zur Durchfuehrbarkeit Eines Infrarotastronomie-Satellitenexperimentes.
R. Katterloher, and K. Schwenzfeger. 1 Jan 73, 106p TUM-LRT-TB-1
In German; English Summary.

Descriptors: *Astronomical observatories, *Experimental design, *Feasibility analysis, *Infrared astronomy, *Satellite design, Orbit calculation, Spaceborne telescopes, Spacecraft structures.

For abstract, STAR 1317

N75-26554/6GA PC$3.75/MF$2.25
Texas Univ., Dallas.
Planetary Atmosphere Parameters and OGO-6 Data and Plots.
Semiannual Status Report, period ending 15 Mar. 1975.
F. S. Johnson. Jun 75, 42p NASA-CR-142964
Contract NGL-44-004-026

Descriptors: *Ogo-6, *Planetary atmospheres, *Planetary composition, *Satellite observation, Data processing, Gases, Ion temperature, Particle density (Concentration).

For abstract, STAR 1317

N75-26937/3GA PC$4.25/MF$2.25
Iowa Univ., Iowa City. Dept. of Physics and Astronomy.
The 1973 Solar Occultation of the Crab Nebula Pulsar.
J. M. Weisberg. May 75, 72p NASA-CR-142984, U-OF-IOWA-75-15
Contract NGL-16-001-002

Descriptors: *Crab nebula, *Pulsars, *Solar eclipses, Astronomical models, Electron density (Concentration), Electron scattering, Radio waves, Solar activity, Solar corona.

For abstract, STAR 1317

N75-26938/1GA PC$4.25/MF$2.25
Systems Research Lab., Champaign, Ill.
Research Study on Stabilization and Control. Modern Sampled-Data Control Theory. Stability Analysis of the Low Cost Large Space Telescope System.
Bimonthly Report.
B. C. Kuo, and G. Singh. 1 May 75, 55p NASA-CR-143871
Contract NAS8-29853

Descriptors: *Control stability, *Control theory, *Spaceborne telescopes, *Systems analysis, Analog simulation, Astronomy, Digital command systems, Fourier analysis, Mathematical models, Reaction wheels, Real numbers.

For abstract, STAR 1317

N75-26939/9GA PC$3.25/MF$2.25
Hale Observatories, Pasadena, Calif.
The Spectral Energy Distribution of Ngc 1275.
G. A. Shields, and J. B. Oke. 1975, 19p NASA-CR-143039
Contract NGL-05-002-134

Descriptors: *Interstellar gas, *Radio galaxies, *Spectral energy distribution, Constellations, Cosmic gases, Radio astronomy, Spectral emission, Stellar radiation.

For abstract, STAR 1317

N75-26941/5GA PC$3.75/MF$2.25
Columbia Univ., New York. Astrophysics Lab.
X-Ray Astronomy.
Status Report, 1 Jan. - 31 Dec. 1974.
R. Novick. Jul 75, 33p NASA-CR-142981, CAL-1267
Contract NGR-33-008-102

Descriptors: *Crab nebula, *Cygnus constellation, *X ray astronomy, Lunar occultation, Proportional counters, Rocket-borne instruments, Sounding rockets, X ray spectra, X ray telescopes.

For abstract, STAR 1317

N75-26942/3GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Pulsar Average Waveforms and Hollow Cone Beam Models.
D. C. Backer. Jun 75, 44p NASA-TM-X-70917, X-693-75-138
Subm-Submitted for Publication.

Descriptors: *Astronomical models, *Collimation, *Pulsars, *Waveforms, Extraterrestrial radio waves, Histograms, Radio astronomy, Radio frequencies, Radio spectra.

For abstract, STAR 1317

N75-26943/1GA PC$4.75/MF$2.25
Chalmers Univ. of Technology, Goteborg (Sweden). Onsala Space Obs.
Radio Observations of Interstellar CH, Part 2.
A. Hjalmarson, A. Sume, J. Ellder, O. E. H. Rydbeck, and E. Moore. 1975, 98p RR-124

Descriptors: *Free radicals, *Hydrocarbons, *Interstellar matter, *Radio observation, Emission spectra, Hydrogen clouds, Hyperfine structure, Nebulae, Statistical analysis, Traveling wave masers.

For abstract, STAR 1317

N75-26944/9GA PC$6.25/MF$2.25
Ruhr Univ., Bochum (West Germany). Inst. fuer Astronomie.
Photographic Ubv Magnitudes in 14 Young Star Clusters of the Northern Milky Way Photographische Ubv-Helligkeiten in 14 Jungen Sternhaufen der Noerdlichen Milchstrasse.
A. F. J. Moffat, and N. Vogt. 1974, 170p RUB-AI-2
Subm-Sponsored in Part by Deut. Forschungsgemeinschaft and Imperial Oil CO., Can.
In German; English Summary.

Descriptors: *Brightness, *Milky way galaxy, *Photographic plates, *Star clusters, *Ubv spectra, Schmidt cameras, Stellar luminosity.

For abstract, STAR 1317

N75-26949/8GA PC$4.25/MF$2.25
Alabama Univ., Huntsville.
Relativistic Astrophysics.
Final Report, 1974 - 1975.
L. L. Smalley. 1975, 51p NASA-CR-142988, FR-4
Contract NGL-01-008-001

Descriptors: *Astrophysics, *Gravitational fields, *Newton-raphson method, *Relativistic theory, Approximation, Gauge invariance, Magnetohydrodynamics, Scalars, Tensor analysis, Transformations (Mathematics).

For abstract, STAR 1317

N75-26950/6GA PC$4.25/MF$2.25
South Carolina Univ., Columbia.
Infrared Spectra of Molecules and Materials of Astrophysical Interest.
Quarterly Progress Report, 15 Mar. - 15 Jun. 1975.
J. R. Durig. Jul 75, 55p NASA-CR-143025, REPT-32
Contract NGL-41-002-003

Descriptors: *Atmospheric composition, *Infrared spectra, *Planetary atmospheres, Atmospheric chemistry, Photochemical reactions, Spectrum analysis, Vibrational spectra.

For abstract, STAR 1317

N75-26957/1GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Magnetostatic Potential Theory and the Lunar Magnetic Dipole Field.
M. L. Goldstein. May 75, 7p NASA-TM-X-70919, X-692-75-142
Subm-Submitted for Publication.

Descriptors: *Lunar magnetic fields, *Potential theory, Laplace equation, Magnetic dipoles, Magnetostatic fields, Numerical analysis.

For abstract, STAR 1317

N75-26958/9GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Martian Atmospheric Lee Waves.
J. A. Pirraglia. May 75, 35p NASA-TM-X-70915, X-622-75-123
Subm-Submitted for Publication.

Descriptors: *Lee waves, *Mars (Planet), *Planetary atmospheres, Atmospheric models, Cloud photographs, Mariner 9 space probe, Wavelengths, Wind velocity.

For abstract, STAR 1317

N75-26959/7GA PC$9.50/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Physics of the Planet Venus.
A. D. Kuzmin, and M. Y. Marov. Jun 75, 334p NASA-TT-F-16226
Contract NASW-2481
Tran-Transl. into English of the Book "Fizika Planety Venera" Moscow, Nauka Press, 1974 408 p.

Descriptors: *Planetary environments, *Venus (Planet), Planetary rotation, Planetary structure, Planetary surfaces, Planetary temperature, Venus atmosphere, Venus probes.

For abstract, STAR 1317

N75-26964/7GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Photonuclear Interactions of Ultrahigh Energy Cosmic Rays and Their Astrophysical Consequences.
J. L. Puget, F. W. Stecker, and J. H. Bredekamp. Jul 75, 53p NASA-TM-X-70920, X-602-75-154
Subm-Submitted for Publication.

Descriptors: *Cosmic rays, *High energy interactions, *Photonuclear reactions, Astrophysics, Energy dissipation, Evolution (Development), Galactic radiation, Monte carlo method, Nuclei (Nuclear physics), Radiation spectra.

For abstract, STAR 1317

3C. Celestial Mechanics

N75-26940/7GA PC$3.25/MF$2.25
Texas Univ., Austin. Dept. of Astronomy.
The Theory of Enceladus and Dione: An Application of Computerized Algebra in Dynamical Astronomy.
W. H. Jefferys, and L. M. Ries. 1974, 12p NASA-CR-142980
Contract NGR-44-012-282

Descriptors: *Celestial mechanics, *Natural satellites, *Saturn (Planet), Computer programs, Invariance, Machine oriented languages, Magnetic resonance, Measure and integration, Poisson density functions, Satellite perturbation.

For abstract, STAR 1317

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-A013 671/3GA PC$3.75/MF$2.25
Iowa Univ Iowa City Dept of Physics and Astronomy
Electron Angular Distributions Above the Dayside Auroral Oval.
Research rept.,
J. D. Craven, and L. A. Frank. Jun 75, 33p Rept no. U. of Iowa-75-23
Contracts N00014-68-A-0196-0009, NAS5-11265
Sponsored in part by Contract NAS5-11265.

Descriptors: *Aurorae, Electrostatic precipitation, Voltage, Spatial distribution, Time dependence, Day, Electrostatic analyzers, Atmospheric scattering, Backscattering, Energy levels, Magnetic fields, Pitch(Inclination), Geomagnetism, Alignment, Low altitude, Plasmas(Physics), Scientific satellites.
Identifiers: *Auroral oval, Ariel 4 Satellite, Plasma analyzers.

An electrostatic analyzer, a LEPEDEA, was employed on the low-altitude satellite Ariel-4 to gain pitch angle distributions of electron intensities with good temporal resolution within the energy range 205 eV to 12.5 keV over the dayside auroral oval. Two major precipitation zones were encountered--an equatorward zone of broad spectra with intensities of approximately 10,000 electrons/(sq cm-sec-sr-eV) and a poleward zone, the polar cusp, with intensities typical of the magnetosheath. Angular distributions within the equatorward zone are generally isotropic outside of the atmospheric backscatter cone. The precipitation mechanism would appear to be pitch angle scattering near the distant magnetic equator. In contrast, pitch angle distributions within the polar cusp are often found to be strongly field aligned with intensities within the atmospheric loss cone greater by factors of approximately 10 than the mirroring intensities. These angular distributions within the dayside polar cusp are qualitatitively similar to those for the inverted-V precipitation events at later local times, and probably share a common acceleration mechanism with the inverted-V phenomenon.

AD-A013 689/5GA PC$4.25/MF$2.25
Aerospace Corp El Segundo Calif Space Physics Lab
The Energetic Electron Environment in Circular Polar Orbits.
Interim rept.,
Alfred L. Vampola. 15 Jul 75, 61p Rept no. TR-0076(6260-20)-2 SAMSO-TR-75-176
Contract F04701-75-C-0076

Descriptors: *Magnetosphere, *Electron density, Space environments, Solar flares, Radiation hazards, Scientific satellites.
Identifiers: OV3-3 satellite.

Energetic electron measurements made during the latter half of 1966 by a magnetic spectrometer on spacecraft 1966-70A (OV3-3) are used to provide plots of the probability function P(f>f sub 0) for circular polar orbits at various altitudes under varying magnetospheric conditions. The plots are intended for use in determining the total fluence to which low-altitude polar-orbiting satellites will be exposed and also the probability that a critical threshold flux at a given energy will be exceeded.

AD-A013 690/3GA PC$3.75/MF$2.25
Aerospace Corp El Segundo Calif Space Physics Lab
Electron Fluxes and Correlations with Quiet-Time Auroral Arcs.
Interim rept.,
P. F. Mizera, D. R. Croley, Jr., F. A. Morse, and A. L. Vampola. 30 Jul 75, 38p Rept no. TR-0076(6260-20)-4 SAMSO-TR-75-202
Contract F04701-75-C-0076

Descriptors: *Aurorae, *Electron flux, Magnetic disturbances, Polar orbit trajectories, Electron energy, Anisotropy, Scientific satellites, Ionosphere.
Identifiers: DMSP-30 satellite, STP 72-1 satellite, DMSP satellites.

Primary electron fluxes, measured by two satellites as they crossed quiet-time auroral arcs, are presented for times near 14:20 UT on Nov 12, 1972. The DMSP-30 satellite measured the optical intensity at 0.6 to 1.0 Micrometer (FWHM) and precipitated electrons with 0.22 = or < E = or < 19.7 keV near 2100 MLT. The 72-1 satellite crossed the auroral arc system near 2200 MLT and measured 0.36 to 16.5 keV electrons at all pitch angles. A detailed description of the electron morphology that includes comparisons of electron fluxes with optical intensities is presented.

AD-A013 691/1GA PC$3.25/MF$2.25
Aerospace Corp El Segundo Calif Space Physics Lab
Proton Precipitation by a Whistler-Mode Wave from a VLF Transmitter.
Interim rept.,
Harry C. Koons. 14 Jul 75, 19p Rept no. TR-0076(6960-02)-1 SAMSO-TR-75-187
Contract F04701-75-C-0076

Descriptors: *Magnetosphere, *Protons, Radio waves, Very low frequency, Wave propagation, Electron density, Proton counters, Precipitation, Counting, Interactions.
Identifiers: Whistler waves, Whistler mode amplification.

Protons with 50 keV < E < 530 keV were detected by sensors aboard satellite 1972-76B at an altitude of 700 km in the region conjugate to the transportable very-low-frequency (TVLF) transmitter which was being operated near Anchorage, Alaska (L approximately = 4). Temporal maxima in the proton count rates can be identified on a one-to-one basis with short pulsed transmissions by the VLF transmitter. The observed time delay between the center of a transmitted pulse and the detection of the next maximum in the proton count rate at the sensor agrees well with the delay predicted from a simple plasmaspheric model.

AD-A013 692/9GA PC$3.75/MF$2.25
Aerospace Corp El Segundo Calif Space Physics Lab
Atmospheric Density at 169 km From Accelerometer Measurements and Orbital Decay of a Low-Altitude Satellite.
Interim rept.,
B. K. Ching, and H. R. Rugge. 30 Jul 75, 27p Rept no. TR-0076(6960-04)-3 SAMSO-TR-75-200
Contract F04701-75-C-0076

Descriptors: *Thermosphere, *Atmospheric density, Geomagnetism, Atmosphere models, Scientific satellites, Graphs, Variations, Structural properties.

Atmospheric densities at 169 km were obtained for the period 19 August - 3 September 1970 from the measurements of an accelerometer on a low-altitude satellite and from the orbital decay of the same satellite. Three different sets of local-time and latitude conditions were provided by the data; two from the accelerometer measurements, before and after perigee, and one at perigee, from the oribital decay data.

AD-A013 694/5GA PC$3.75/MF$2.25
Aerospace Corp El Segundo Calif Space Physics Lab
Global Distribution of High-Altitude Ozone from a UV Spectrometer.
Interim rept.,
Lawrence R. Sharp, and Hugo R. Rugge. 14 Jul 75, 37p Rept no. TR-0076(6960-04)-4 SAMSO-TR-75-177
Contract F04701-75-C-0076

Descriptors: *Ozone, *Ultraviolet spectrometers, *Upper atmosphere, Remote detectors, Chemical analysis, Scanning, Albedo, Daylight, Spaceborne.
Identifiers: Atmospheric composition, Spectroscopic analysis.

A satellite-based uv spectrometer that obtained daytime earth radiance measurements in the 1700- to 3100-A region is described. Radiance and earth albedo data are displayed, and a list of available data is provided. A parameter related to the relative high-altitude (h = or > 35 km) ozone concentration is correlated with solar zenith angle, time, and geographic position.

AD-A013 719/0GA PC$4.25/MF$2.25
Aerospace Corp El Segundo Calif Chemistry and Physics Lab
Band Model Calculation of Atmospheric Transmittance for Hot Gas Line Emission Sources. Account of Doppler Broadening.
Interim rept.,
Stephen J. Young. 30 Jul 75, 62p Rept no. TR-0076(6970)-5 SAMSO-TR-75-212
Contract F04701-75-C-0076, DARPA Order-2843
See also report dated 31 Dec 74, AD-A005 632.

Descriptors: *Band spectra, *Plumes, Absorption(Physical), Mathematical models, Carbon dioxide, Water vapor, Optical properties, Exhaust gases, Transmittance, Infrared detection, Doppler effect, Infrared radiation, Atmospheres, Radiative transfer.
Identifiers: *Atmospheric transmissivity, Atmospheric attenuation, Missile plumes.

The effective transmittances along a slant path from the source altitude to space at a zenith angle of 75 deg are computed and averaged over three wide bandpasses in the 2.7 micrometer spectral region. Statistical band model calculations are performed for the assumption that the emission-absorption lines have a Lorentz, Doppler, or Voigt profile. Inhomogeneities inherent in treating the line of sight through the and the hot gas source as a single, highly inhomogeneous optical path are accounted for by using either the Curtis-Godson, the Lindquist-Simmons, or the two-path derivative approximation. The latter is derived herein and is shown to be superior to the Lindquist-Simmons approximation in treating radiative transfer calculations for the Doppler or Voigt line shape. With line shape properly accounted for, the results still indicate a large difference between the effective atmospheric transmittance and the atmospheric transmittance appropriate for continuum emission. This large difference can result only from the high degree of line correlation that exists between the hot H2O/CO2 emission spectrum and the cool H2O/CO2 atmospheric absorption spectrum.

AD-A013 754/7GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Stratospheric Aerosol Parameters for the Fuego Volcanic Incursion,
Louis Elterman. 10 Jan 75, 3p Rept no. AFCRL-TR-75-0396
Availability: Pub. in Applied Optics, v14 p1262-1263 Jun 75.

Descriptors: *Stratosphere, Dust clouds, Volcanoes, Ashes, Guatemala, Aerosols, Dust, Searchlights, Light transmission, Attenuation, Backscattering, Light scattering, Reprints.
Identifiers: Volcanic eruptions, Volcanic dust.

The Fuego Volcano in Guatemala erupted in October 1974 resulting in a heavy infusion of volcanic dust through the stratosphere. In this paper, the stratospheric parameters obtained with searchlight optical probing are charted and tabulated for twelve vertical aerosol profiles. (Author)

AD-A013 777/8GA PC$3.75/MF$2.25
Air Base Group (4683rd) Thule AFB (Greenland)
Densitometric Analysis to Determine Artificial Cloud Expansion Characteristics.
Final rept. 1 Apr 73-15 Feb 75,
Christian A. Trowbridge, and Irving L. Kofsky. 14 Mar 75, 49p Rept no. PhM-102-75 AFCRL-TR-75-0147
Contract F19628-72-C-0259

Descriptors: *Upper atmosphere, *Stratosphere, *Atmospheric sounding, *Atmospheric motion, Turbulence, Turbulent diffusion, Wind, Spectrum analysis, Fourier transformation.
Identifiers: Chemical release studies, Barium clouds.

Microdensitometric film reduction and computer analysis and display techniques were applied to optical data on smoke and chemical tracers in the stratosphere and upper atmosphere. Photographic brightness distributions were converted to digital optical density arrays recorded on magnetic tape and subsequently reduced by statistical and Fourier methods to determine turbulence parameters and diffusion coefficients. Stratospheric wind data derived by the smoke trail method were spectrum analysed and Richardson numbers determined. A new approach to separation of turbulence data from the mean wind was used and an alternative to Fourier methods implemented for spectrum analysis.

AD-A013 780/2GA PC$4.25/MF$2.25
Illinois Univ At Urbana-Champaign Dept of Electrical Engineering
Motions in the Ionosphere.
Technical rept. no. 55,
Kung C. Yeh, and Chao H. Liu. May 75, 67p Rept nos. UILU-ENG-75-2546, Scientific-2 AFCRL-TR-75-0334
Contract F19628-74-C-0044, Grant NSF-GA-42857

Descriptors: *Ionosphere, *Thermosphere, *Atmospheric motion, Electron density, Wind direction, Wind velocity, D region, Gravity waves, Ionospheric disturbances, Atmospheric tides.
Identifiers: E region, F region, Traveling ionospheric disturbances.

Atmospheric motions at ionospheric heights are discussed. Various ionospheric processes and the time constants with which these different processes may take place are covered.

AD-A013 784/4GA PC$4.75/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Atlas of Cloud-Free Line-of-Sight Probabilities. Part 1. Germany.
Air Force surveys in geophysics,
Iver A. Lund, Donald D. Grantham, and Clarence B. Elam, Jr. 8 May 75, 76p Rept nos. AFCRL-AFSIG-309, AFCRL-TR-75-0261

Descriptors: *Cloud cover, *Germany(East and West), Light transmission, Line of sight, Atmospheres, Probability, Mathematical models, Maps.
Identifiers: *Atmospheric transmissivity, Atlases, Cflos(Cloud Free Line of Sight), *Cloud free line of sight.

This is the first part of a planned Northern Hemisphere atlas of probabilities of cloud-free lines-of-sight between the earth and space, and the earth and an altitude of 2500 m (8200 ft). The probabilities are for the mid-season months-January, April, July, and October; four times of the day-0000-0200 LST, 0600-0800 LST, 1200-1400 LST, and 1800-2000 LST; and four elevation angles- 10, 30, 50, and 90 degrees.

AD-A013 785/1GA PC$3.75/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Global Morphology of Ionospheric Scintillations II.
Air Force surveys in geophysics,
Jules Aarons. 11 Mar 75, 26p Rept nos. AFCRL-AFSIG-304, AFCRL-TR-75-0135
See also report dated 16 Oct 70, AD-717 694.

Descriptors: *Ionosphere, *Ionospheric disturbances, Scintillation, Aurorae, Ionospheric modification, Magnetic storms, Polar cap absorption, Diurnal variations.
Identifiers: *Ionospheric scintillations, F region.

Updating a review of the global morphology of ionospheric scintillations published in 1971, this study adds additional experimental studies on familiar topics to newer types of measurements of ionospheric irregularities, including in situ experiments and artificial heating of the F-layer.

AD-A013 792/7GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Techniques for Depositing Visible Smoke Trails in the Stratosphere for Measurement of Winds and Turbulence.
Instrumentation papers,
William K. Vickery. 21 Apr 75, 17p Rept nos. AFCRL-TR-75-0221, AFCRL-IP-230

Descriptors: *Stratosphere, *Smoke generators, *Atmospheric motion, Wind velocity, Turbulence, Measurement.

Air Force Cambridge Research Laboratories conducted two field programs at the White Sands Missile Range to obtain experimental data for the Climatic Impact Assessment Program of the Department of Transportation. These data provide a prediction of the residence time and behavior of exhaust products deposited by supersonic aircraft in the stratosphere. The data were obtained by photographing smoke trails from rockets and aircraft dispensing systems. This report describes the development and flight results of (1) the rocket dispensing system, designed to produce vertical smoke trails over the 12- to 25-km region, and (2) the aircraft dispensing system, designed to produce horizontal trails at 16- and 20-km altitudes.

AD-A013 913/9GA PC$3.75/MF$2.25
IIT Research Inst Chicago Ill
Composition of the Atmosphere at 10,000-40,000 Feet Using a Modified Matrix Isolation Technique.
Final rept. 1 Dec 73-30 Jun 75,
Alan Snelson. 1975, 30p Rept no. IITRI-C6303-9 AFOSR-TR-75-1171
Contract F44620-74-C-0033
See also report dated 24 Sep 74, AD-A000 574.

Descriptors: *Tropopause, *Stratosphere, Methane, Gas analysis, Chromatographic analysis, Chemical composition, Water vapor, Infrared spectroscopy, Carbon dioxide, Nitrogen oxides, Nitrogen, Airborne, Samplers, Air,

Cryogenics, Experimental design, Engineering drawings, Optical detectors, Solidified gases.
Identifiers: *Atmospheric composition, *Gas sampling, Matrix isolation techniques, Nitrogen oxide(N2O).

A mechanical cryogenic air sampler was adapted so that optical measurements could be made on a frozen air sample. Air samples were to be collected in the 10,000 to 40,000 ft range, but due to aircraft availability difficulties, no air samples were obtained; laboratory studies showed that IR optical spectroscopy was suitable for measuring water vapor and CO2 concentrations at less than 1ppm. Calibration curves for CH4, CO, CO2, N2O and H2O were obtained in the ranges that these gases are found in the atmosphere.

AD-A013 937/8GA PC$3.75/MF$2.25
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
Physics and Chemistry of Atmospheres.
Final rept. May-Dec 74,
Billy M. McCormac. 9 Apr 75, 49p Rept no. LMSC-D407479 DNA-3573F
Contract DNA001-74-C-0141
Summary of Institute Proceedings - Summer Advanced Study Institute held at Liege Univ., Belgium, 29 Jul-9 Aug 74. Supersedes report dated Dec 74, AD-A003 600.

Descriptors: *Atmospheric physics, *Atmospheric chemistry, Meetings, Planetary atmospheres, Energy transfer, Aeronomy, Reaction kinetics, Molecular spectroscopy, Ionosphere, Thermosphere, Mars(Planet), Venus(Planet), Belgium.
Identifiers: Atmospheric composition, Venus atmosphere, Mars atmosphere.

The Advanced Study Institute, 'Physics and Chemistry of Atmospheres,' held at the University of Liege, Liege, Belgium, July 29 - August 9, 1974, was attended by 119 persons from 10 different countries. The objective of the Institute was to correlate the diverse aspects of atmospheric research to achieve a better understanding of the atmospheres of the Earth as well as the nearer planets. Not only aerodynamics, astronomy, chemistry, and physics are involved, but each of these, particularly physics, is highly subdivided. This paper is a summary of some of the significant findings reported at the Institute.

AD-A013 954/3GA PC$3.75/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
E-Region Temperature Measurements at Millstone Hill.
Journal article,
Joseph E. Salah, John V. Evans, and Roland H. Wand. 4 Apr 74, 30p Rept no. JA-4372 ESD-TR-75-194
Contract F19628-73-C-0002
Availability: Pub. in Jnl. of Atmospheric and Terrestrial Physics, v37 p461-489 1975.

Descriptors: *Thermosphere, Temperature, Day, Thermal properties, Incoherent scattering, Diurnal variations, Atmospheric tides, Atmosphere models, Wavelengths, Oscillation, Amplitude, Altitude, Sun, Radar pulses, Reprints.
Identifiers: *E region, Solar tides.

An incoherent scatter radar experiment involving the transmission of pairs of short pulses at various spacings was employed at Millstone Hill to study the daytime thermal structure of the lower thermosphere. An altitude range from 110 to 130 km was covered with a height resolution of 6 km. The daily temperature variation exhibited oscillations having dominant periods in the range 6-14 hr and amplitudes as large as 28 per cent of the mean temperature. These waves possessed a downward phase velocity indicating an energy source at lower heights. A spectral analysis carried out on measurements gathered on successive days provided sufficient frequency resolution to resolve the different tidal frequencies and indicated the 12-hr period as the main component. Interpreting the measured oscillations as being primarily a manifestation of the solar semidiurnal tide, the observed phase and vertical wavelength are in agreement with theoretical predictions for the thermal (2, 4) tidal mode propagating from the lower atmosphere. On average, the semidiurnal wave amplitude is about 40 K with a time of maximum near 0700 hr LT at 115 km and is damped above that height. Large variability in amplitude and phase are found from one observing period to another. The height gradient of the average daytime temperature near 120 km is about 15 K/km. This value is larger than given by some theoretical treatments but is consistent when the energy carried into the region by the semidiurnal tide is allowed for. (Author)

AD-A013 964/2GA PC$3.75/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
An Ionospheric Substorm Model,
C. P. Pike, S. -I. Akasofu, and R. A. Wagner. 24 Jul 75, 35p Rept no. AFCRL-TR-75-0390
Pub. in Defense Meteorological Satellite Program Auroral-Ionospheric Interpretation Guide, p17-49, 4 Apr 75, AD-A013 165.

Descriptors: *Ionosphere, *Magnetic storms, *Atmosphere models, Aurorae, Photographs, Scientific satellites, Night.
Identifiers: E region, F region, DMSP satellites, Spaceborne photography.

An ionospheric substorm model is presented in schematic form for the nightside. The purpose of the model is to provide a basis for identifying in DMSP photos the different phases of an ionospheric substorm and to estimate how some associated ionospheric parameters would vary during the substorm.

AD-A013 965/9GA PC$3.75/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Auroral-Ionospheric Variability,
C. P. Pike. 24 Jul 75, 30p Rept no. AFCRL-TR-75-0391
Pub. in Defense Meteorological Satellite Program Auroral-Ionospheric Interpretation Guide, p51-78, 4 Apr 75, AD-A013 165.

Descriptors: *Ionosphere, *Aurorae, Polar cap, Photographs.
Identifiers: E region.

The report discusses various types of auroral conditions which occur frequently and are not necessarily associated with substorms. Specifically, a description of good quality photos is presented for the purpose of illustrating specific points considered significant for interpretation of the photos in terms of ionospheric structure. These photos include extremely quiet conditions as well as extremely disturbed conditions; also included are observations of midday auroras and of auroras in the presence of moonlight. Emphasis is placed on relating auroral patterns to ionospheric structure.

AD-A014 011/1GA PC$3.25/MF$2.25
Alaska Univ College Geophysical Inst
Infrasonic Wave Generation by Aurora,
Charles R. Wilson. 1974, 22p Rept no. UAG-Contrib-A456 AFOSR-TR-75-1164
Contract F44620-71-C-0064
Availability: Pub. in Jnl. of Atmospheric and Terrestrial Physics, v37 p973-988 1975.

Descriptors: *Aurorae, *Infrasonics, Acoustic waves, Ionospheric propagation, Electron density, Incoherent scattering, Radar, Magnetic storms, Electric arcs, Asymmetry, Sources, Reprints.
Identifiers: Auroral electrojets, AIW(Auroral infrasonic waves), *Auroral infrasonic waves, E region.

A comparison of the characteristics of auroral infrasonic waves (AIW) in the passband from 10 to 100 sec. period is given for trans-auroral zone stations. The morphology of 2Hz auroral infrasound observed at Kiruna, Sweden is described. An important asymmetry in the generation of AIW bow waves, with respect to poleward or equatoward motion of auroral electrojet arcs, is shown to be related to the morphology of the ionosphere E-region electric field during an auroral substorm. Auroral radar studies of AIW source arcs are presented. Incoherent scatter radar observations of electron density profiles of auroral arcs are used to describe the differences in arcs that do or do not produce AIW in an attempt to explain the asymmetry in AIW generation by supersonic auroral arcs. An infinite line-current induction model of an auroral electrojet moving transverse to its axis above a conducting earth is used to determine the relationship of an AIW to the surface magnetic perturbation produced by the electrojet. The role of the auroral electrojet in AIW production is discussed in a study of polar magnetic substorms wherein westward traveling auroral surges and the eastern ends of westward auroral electrojets were found to be strong sources of AIW.

E75-10357 PC$3.25/MF$2.25
National Environmental Satellite Service, Washington, D.C.
A Cloud Physics Investigation Utilizing Skylab Data.
Quarterly progress rept. no. 9, Apr-Jun 75,
John Alishouse, Herbert Jacobowitz, and David Wark. Jun 75, 3p NASA-CR-143159
Contract NASA Order-T-4715-B

Descriptors: Cloud physics, Infrared spectrometers, Solar radiation, Computer programs, Absorption spectra, EREP, Skylab program, Zenith, Channels(Data transmission).

The author has identified the following significant results. The Lowtran 2 program, S191 spectral response, and solar spectrum were used to compute the expected absorption by 2.0 micron band for a variety of cloud pressure levels and solar zenith angles. Analysis of the three long wavelength data channels continued in which it was found necessary to impose a minimum radiance criterion. It was also found necessary to modify the computer program to permit the computation of mean values and standard deviations for selected subsets of data on a given tape. A technique for computing the integrated absorption in the A band was devised. The technique normalizes the relative maximum at approximately .78 micron to the solar irradiance curve and then adjusts the relative maximum at approximately .74 micron to fit the solar curve.

E75-10358 PC$3.25/MF$2.25
Boeing Co., Kent, Wash.
Quantitative Determination of Stratospheric Aerosol Characteristics.
Monthly rept.,
David L. Tingey. Jun 75, 14p NASA-CR-143160
Contract NAS9-13303

Descriptors: Aerosols, Stratosphere, Spectral signatures, EREP, Skylab program, Multispectral band scanners, Brightness, Curve fitting, Random noise.

The author has identified the following significant results. The multiplicative scale factor

needed to calibrate the recorded intensity is obtained by fitting the measured curve against a brightness model. The model was converted to the multispectral band scanner signal. Inversion of this measured signature is shown as the profile of attenuation coefficients versus altitude. Because of gaussian noise, data were not measured directly. Data were fit with two exponential curves, one covering the lower altitude and the other covering the higher altitude. A twenty point curve was derived by selecting a data point and plotting its value from each of twenty adjacent scans. Noise from the lower altitudes was found to be erratic.

N75-26344/2GA PC$4.75/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Abteilung fuer Extraterrestrische Sensortechnik.
Optical Experiments in the Additional Rocket Program for Azur, Project Spaz. Part 1: Aurora Photometer Z.6 die Optischen Experimente im Zusatzraketen-Programm Zu Azur, Projekt Spaz. Teil 1: Das Polarlicht-Photometer Z.6.
Final Report.
D. Beran. Dec 74, 94p BMFT-FB-W-74-13
Contract WRK-114-A
In German; English Summary.

Descriptors: *Auroras, *Azur satellite, *Photometers, *Sounding rockets, Calibrating, Environmental tests, Rocket-borne instruments.

For abstract, STAR 1317

N75-26345/9GA PC$4.25/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Oberpfaffenhofen (West Germany). Abteilung fuer Extraterrestrische Sensortechnik.
Optical Experiments in the Additional Rocket Program for Azur, Project Spaz. Part 2: The Ionization Chamber Photometer Z.7A and the Ebert Spectrometer Z.7B die Optischen Experimente im Zusatzraketenprogramm Zu Azur, Projekt Spaz. Teil 2: Das Ionisationskammer-Photometer Z.7A und das Ebert-Spektrometer Z.7B.
Final Report.
D. Beran. Dec 74, 73p BMFT-FB-W-74-14
Contract WRK-144-B
In German; English Summary.

Descriptors: *Azur satellite, *Ebert spectrometers, *Photometers, *Sounding rockets, Auroras, Calibrating, Environmental tests, Ionization chambers, Rocket-borne instruments.

For abstract, STAR 1317

N75-26474/7GA PC$5.25/MF$2.25
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
Atmospheric Effects in Multispectral Remote Sensor Data.
Final Technical Report, 15 May 1974 - 14 Mar. 1975.
R. E. Turner. May 75, 120p NASA-CR-141863, ERIM-109600-15-F
Contract NAS9-14123

Descriptors: *Atmospheric attenuation, *Atmospheric scattering, *Multispectral photography, *Remote sensors, Agriculture, Algorithms, Data reduction, Earth albedo, Landsat satellites, Radiative transfer, Simulation.

For abstract, STAR 1317

N75-26556/1GA PC$5.25/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Hot, Cold, and Annual Reference Atmospheres for Edwards Air Force Base, California (1974 Version).
D. L. Johnson. Jul 75, 111p NASA-TM-X-64941

Descriptors: *Annual variations, *Military air facilities, *Reference atmospheres, Atmospheric density, Atmospheric pressure, Atmospheric temperature, Sounding rockets, Subroutines, Thermodynamic properties.

For abstract, STAR 1317

N75-26557/9GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Relative Concentration of Water Vapor in the Mesosphere of the Arctic Latitudes and Mid-Latitudes of the USSR as Measured by Radiofrequency Mass Spectrometers.
E. D. Byuro, and G. M. Martynkevich. Jun 75, 17p NASA-TT-F-16413
Contract NASW-2481
Tran-Transl. Into English from TR., Nauchn. Soveshchaniye Po Mezosfernym Oblakam (Riga), 1970 p 25-36.

Descriptors: *Arctic regions, *Mass spectroscopy, *Mesosphere, *U.s.s.r., *Water vapor, Atmospheric composition, Hydrogen atoms, Mesopause, Radio frequencies, Solar wind, Thermosphere.

For abstract, STAR 1317

N75-26562/9GA PC$3.25/MF$2.25
Ludwig-Maximilians-Universitat, Munich (West Germany). Abteilung fuer Atmosphaerische Strahlung und Satellitenmeteorologie.
Occultation Experiment for the Determination of the O2 Density Profile in the Thermosphere Okkultationsexperiment Zur Bestimmung des O2-Dichteprofils in der Thermosphaere.
Final Report.
H. J. Bolle, L. Bierling, and V. Aman. Dec 74, 17p BMFT-FB-W-74-12
Contract WRK-234
In German; English Summary.

Descriptors: *Density distribution, *Oxygen, *Radiometers, *Rocket-borne instruments, *Thermosphere, Gas density, Occultation, Schumann-runge bands, Sounding rockets.

For abstract, STAR 1317

N75-26601/5GA PC$3.75/MF$2.25
Weapons Research Establishment, Salisbury (Australia).
Measurements of the Basic Atmospheric Parameters at Woomera Using the Falling Sphere January to May 1974.
P. H. O. Pearson. Feb 75, 46p WRE-TN-1331(WR/D)

Descriptors: *Atmospherics, *Falling spheres, *Meteorological parameters, *Upper atmosphere, Atmospheric density, Atmospheric pressure, Atmospheric temperature, Wind (Meteorology).

For abstract, STAR 1317

N75-26842/5GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Cyclotron Side Band Emissions from Magnetospheric Electrons.
K. Maeda. May 75, 19p NASA-TM-X-70914, X-602-75-121
Subm-Submitted for Publication.

Descriptors: *Cyclotron frequency, *Emission spectra, *Magnetospheric instability, *Sidebands, *Very low frequencies, Explorer satellites, Graphs (Charts), Magnetic equator, Tables (Data), Whistlers.

For abstract, STAR 1317

N75-26859/9GA PC$3.25/MF$2.25
Stanford Univ., Calif. Inst. for Plasma Research.
Theoretical and Experimental Studies of Space-Related Plasma Wave Propagation and Resonance Phenomena.
Semiannual Report, 1 Jul. - 31 Dec. 1974.
F. W. Rawford. Mar 75, 16p SU-IPR-630, SAR-16
Contract NGL-05-020-176

Descriptors: *Experimental design, *Magnetohydrodynamic waves, *Space laboratories, *Wave excitation, *Whistlers, Electron beams, Protons, Resonance, Wave propagation.

For abstract, STAR 1317

N75-26951/4GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Cosmic Glow.
A. I. Lazarev. Jun 75, 9p NASA-TT-F-16436
Contract NASW-2483
Tran-Transl. Into English from Zemlya Vselennaya (Ussr), No. 2, Mar.-Apr. 1975 p 9-13.

Descriptors: *Earth atmosphere, *Twilight glow, *Upper atmosphere, *Visual observation, Cosmic rays, Cosmonauts, Soyuz spacecraft.

For abstract, STAR 1317

PB-243 524/6GA PC$4.25/MF$2.25
North Carolina State Univ., Raleigh.
Some Topics Relating to Modelling of Dispersion in Boundary Layer,
F. Pasquill. Apr 75, 69p EPA/650/4-75/015 EPA-R-800662

Descriptors: *Atmospheric circulation, *Air pollution, Dispersions, Mathematical models, Partial differential equations, Atmospheric diffusion.
Identifiers: *Atmospheric boundary layer.

This special report discusses six topics all of the major current interest in modelling of dispersion in the atmospheric boundary layer. These are the second-order closure modelling of turbulence, crosswind dispersion and the properties of turbulence, wind direction fluctuation statistics over long sampling times, 'local similarity' treatment of vertical spread from a ground source, representations of dispersion in terms of distance of time, and modelling for elevated sources.

PB-243 635/0GA PC$3.75/MF$2.25
North Carolina State Univ., Raleigh. Dept. of Geosciences.

Effects of Atmospheric Aerosols on Infrared Irradiance at the Earth's Surface in a Nonurban Environment.
Environmental monitoring series,
Michael R. Riches, James T. Peterson, and Edwin C. Flowers. May 75, 44p EPA/650/4-75/017

Descriptors: *Air pollution, *Aerosols, *Atmospheric attenuation, Solar radiation, Turbidity, Light transmission, Temperature, Humidity, Radiometers, Detectors, Infrared radiation, Least squares method, Regression analysis, Earth surface.
Identifiers: Air pollution detection, *Atmospheric transmissivity.

This report describes a study designed to measure hemispheric infrared downward-directed irradiance at the earth's surface and ambient aerosol concentrations at Research Triangle Park, North Carolina. A Funk-type net radiometer (with a blackened cavity on the underside) was used to measure the incident all-wave energy. From the value obtained, the observed solar radiation was subtracted to determine the infrared component. The expected incident infrared irradiance was calculated from prevailing atmospheric conditions. Six methods were used for these calculations: four empirical equations based on surface conditions, the Yamamoto chart, and a radiative transfer program using vertical profiles of temperature and moisture. The observed-minus-calculated downwelling irradiances were then compared to concurrent measurements of turbidity obtained with a Volz sunphotometer, nephelometer-indicated atmospheric extinction coefficient, and a relative humidity. These measurements were analyzed by least-squares regression to determine the extent to which incident hemispheric infrared radiation is affected by varying amounts of atmospheric aerosols and relative humidity.

4B. Meteorology

AD-A013 632/5GA PC$4.75/MF$2.25
Brown Univ Providence R I Dept of Geological Sciences
The Dynamics of Natural Climatic Change.
Final rept. 15 Jun-15 Dec 74,
John Imbrie, R. K. Matthews, and Thompson Webb, III. 17 Jul 75, 82p AFOSR-TR-75-1076
Contract F44620-73-C-0021, ARPA Order-2299
See also report dated 17 Jun 74, AD-783 362.

Descriptors: *Climate, Atmosphere models, Ocean models, Pollen, Geologic age determination, Marine geology, Glaciers, Core sampling, Vegetation, Transfer functions, North America, Gulf Stream, Sea level.
Identifiers: Paleoclimatology, *Climatic changes, Cape Hatteras.

This document summarizes the results of the ARPA Paleoclimate Projects at Brown, with emphasis on work accomplished during the period 15 June 1974 through 15 December 1974. These results include: (1) completion of a numerical experiment on ice-age climate; (2) organization of a data-exchange program with the Soviet Union; (3) formation and analysis of a data bank for pollen data; (4) analysis of the phasing of changes in oceanic circulation and changes in nearby climate and vegetation patterns on land; (5) completion of a review and critique of transfer-function methodology; and (6) documentation of sea-level dynamics during the interval 60,000 - 250,000 YBP.

AD-A013 727/3GA PC$3.25/MF$2.25
Air Weather Service Scott AFB Ill
Annual Survey Report on the Air Weather Service Modification Program (8th) (FY 1975),
Ronald L. Lininger. Jul 75, 8p Rept no. AWS-TR-75-257
See also report dated Jul 74, AD-782 704.

Descriptors: *Weather modification, *Cold fog, *Runways, Dissipation, Visibility, Aviation safety, Propane, Air Force facilities, Costs, Seasonal variations, Washington(State), Alaska, West Germany.
Identifiers: Fairchild Air Force Base, Elmendorf Air Force Base, Hahn Air Base.

The Air Weather Service performed cold-fog seeding at three bases again during the winter of FY 1975. Results are presented in terms of assisted landings or takeoffs. Cost/benefit figures are cited, showing a total ne benefit of about $98,000 for the three bases and for the season.

AD-A013 797/6GA PC$4.25/MF$2.25
Air Weather Service Scott AFB Ill
The AWS Handbook of Ground-Based Cold Fog Dissipation Using Vented Liquid Propane. Volume I - Theory and Practice,
Henry A. Chary, and Ronald L. Lininger. Jul 75, 61p Rept no. AWS-TR-75-255

Descriptors: *Cold fog, *Weather modification, *Fog dispersal, Propane, Dissipation, Supercooling, Drops, Liquids, Nucleation, Ice formation, Adiabatic conditions, Expansion, Condensation nuclei, Supersaturation.

The theory and practice of ground-based cold fog dissipation using vented liquid propane are explained. The cumulative AWS expertise in ground-based cold fog dissipation is summarized. Cold fog dissipation is dependent on the phase transition of liquid water to ice. The ice phase is initiated by severe local cooling due to the adiabatic expansion of vented liquid propane. The ice crystals grow at the expense of the supercooled fog droplets and fall out, thus effecting a clearing. Three operational cold fog dissipation networks are illustrated. Generalized guidance for planning, procuring, installing, and operating a cold fog dissipation system are given.

AD-A013 801/6GA MF$2.25
Environmental Technical Applications Center (Air Force) Washington D C
Autumn Weather Patterns of the Western United States.
Jul 75, 68p Rept no. USAFETAC-TN-75-4
Availability: Available in microfiche only.

Descriptors: *Climate, *Weather forecasting, Autumn, Patterns, Meteorological data, Seasonal variations, Meteorological charts, Coastal regions, United States.
Identifiers: *Western Region (United States).

Reprints of Western Region Technical Attachments 73-35 with Supplement 74-27, 73-39 with Supplement 74-32, and 73-41 are compiled to furnish an excellent climatic guide to Autumn weather patterns over the western United States. The data covers the months of September, October, and November and concerns most of the normally-observed weather parameters.

AD-A013 839/6GA PC$4.75/MF$2.25
New York Univ N Y Courant Inst of Mathematical Sciences
Stability of Rectilinear Geostrophic Vortices in Stationary Equilibrium.
Technical rept.,
Louis Bauer, and George K. Morikawa. Apr 75, 76p Rept no. IMM-406 AFOSR-TR-75-1154
Grant AF-AFOSR-2728-74, ARPA Order-2774

Descriptors: *Atmospheric motion, *Vortices, *Atmosphere models, Anticyclones, Bessel functions, Numerical analysis.

A hemispherical barotropic model of global-scale atmospheric motions is studied in a planar approximation using three (K sup 0) (Bessel)-vortices of equal strength gamma and length scale 1/Kappa to represent the sub-tropical semi-permanent high pressure systems. In equilibrium these anticyclonic vortices are equally spaced on a latitude circle of radius a.

AD-A014 083/0GA PC$3.75/MF$2.25
Environmental Prediction Research Facility (Navy) Monterey Calif
Interrelationships between Tropical North Pacific Atmospheric Circulation, Explosive Volcanism, Sea Surface Temperature and Western North Pacific Tropical Storms and Typhoons.
Technical note,
J. M. Harding, and S. Larson. Aug 75, 26p Rept no. ENVPREDRSCHF-tech note-22

Descriptors: *Atmospheric circulation, *Typhoons, *Tropical cyclones, *North Pacific Ocean, Time series analysis, Surface temperature, Barometric pressure, Sea water, Equatorial regions, Ocean currents, Sea states, Stratosphere, Storms, Volcanoes, Coastal regions, Oscillation, Air water interactions.
Identifiers: Equatorial countercurrents.

Time series of surface atmospheric pressure and sea surface temperature are presented for three areas spanning the tropical North Pacific (Equator to 15N) from the Central American coast to the coast of Asia. Surface pressure time series are shown for the period between 1946 and 1974, while sea surface temperature data and presented for the period between 1962 and 1974. The relation between the Northern Hemisphere manifestation of Walker's 'Southern Oscillation' and the occurrence of warm and cold sea surface temperatures' in the eastern tropical Pacific is shown to support estimates of transport by the Equatorial Countercurrent. Large stratospheric injections of dust and gas by volcanic eruption are shown to generally preceed marked increases in the estimated transport by the Equatorial Countercurrent. Minima of tropical storm and typhoon frequency in the tropical northwest Pacific (especially since 1957) are shown to be associated with low east-west pressure across the equatorial Pacific while frequency maxima are associated with high east-west pressure differences.

COM-75-10992/6GA PC$3.25/MF$2.25
National Oceanic and Atmospheric Administration, Washington, D.C. Center for Experiment Design and Data Analysis.
Correction of BOMEX Radiosonde Humidity Errors.
Technical memo.,
L. D. Sanders, J. T. Sullivan, and P. J. Pytlowany. May 75, 16p NOAA-TM-EDS-BOMAP-16 NOAA-75062008

Descriptors: *Humidity, *Atmospheric sounding, *West Indies, Correction, Radiosondes, Diurnal variations, Errors, Solar radiation, Detectors, Ducts, Heating, Design.
Identifiers: Barbados oceanographic and meteorological experiment, Hygristors.

During the Barbados Oceanographic and Meteorological Experiment (BOMEX) in 1969, rawinsonde soundings indicated a large diurnal variation in relative humidity. Comparison with other measurement systems showed that values were as much as 25% too low at midday. The primary source of error was found to be deficient design of the duct that housed the carbon-coated hygristor, resulting in heating of the sensor by solar radiation. To correct this error, the daytime average ambient vapor pressure for a 7-day period was assumed to be the same as the nighttime average. After applying the correction for radiation, and taking into account the known lag properties of the hygristor, the corrected relative humidities were found in most cases to be within 5% or less of the actual value.

COM-75-11000/7GA PC$4.25/MF$2.25
National Weather Service, Silver Spring, Md. Office of Hydrology.
Storm Tide Frequency Analysis for the Coast of North Carolina, South of Cape Lookout.
Technical memo.,
Francis P. Ho, and Robert J. Tracey. May 75, 52p NOAA-TM-NWS-HYDRO-21 NOAA-75061901

Descriptors: *Storm surges, *Ocean tides, *Coasts, Floods, Insurance, Hurricanes, Oceanographic data, Hydrodynamics, Air water interactions, Risk, Marine meteorology, Cape Lookout, North Carolina.
Identifiers: Water level.

Storm tide height frequency distributions are developed on the coast of North Carolina, south of Cape Lookout, for the National Flood Insurance Program by computing storm tides from a full set of climatologically representative hurricanes, using the National Weather Service hydrodynamic storm surge model. Tide levels are shown in coastal profile between annual frequencies of 0.10 and .002. The report is intended for use in estimating actuarial risk to buildings from coastal floods and in land use management.

COM-75-11001/5GA PC$3.75/MF$2.25
National Weather Service, Silver Spring, Md. Office of Hydrology.
Storm Tide Frequency Analysis for the Coast of Puerto Rico.
Technical memo.,
Francis P. Ho. May 75, 50p NOAA-TM-NWS-HYDRO-23 NOAA-75062503

Descriptors: *Storm surges, *Ocean tides, *Coasts, *Puerto Rico, Floods, Insurance, Hydrodynamics, Mathematical models, Ocean waves, Marine meteorology, Air water interactions, Hurricanes.

Storm tide height frequency distributions in the coast of Puerto Rico are developed for the National Flood Insurance Program by computing storm tides from a full set of climatologically representative hurricanes, using the National Weather Service hydrodynamic storm surge model adapted to local conditions. Hurricane parameters are analyzed and presented. Tide levels for the southern coast of Puerto Rico are shown in coastal profile between annual frequencies of 0.10 and .002. Similar tide levels for San Juan on the northern coast and Mayaguez on the western coast are also presented, and tentative interpolated tide levels of .01 annual frequency for the remaining coasts. Wave effects on the north coast are discussed.

COM-75-11041/1GA PC$8.50/MF$2.25
National Oceanic and Atmospheric Administration, Rockville, Md. Center for Experiment Design and Data Analysis.
BOMEX Synoptic Weather Atlas.
Feb 75, 259p NOAA-75070106

Descriptors: *Meteorological charts, *Atlases, *Weather forecasting, Sea level, Hurricanes, Climate, Remote sensing, Laminar flow, Meteorological data, Shipborne detectors, Marine meteorology, North Atlantic Ocean, Caribbean Sea.
Identifiers: Barbados oceanographic and meteorological experiment, Synoptic meteorology, Streamline analysis.

The atlas presents synoptic charts as an aid to users of the BOMEX data. Included in the atlas are mercator projection charts for sea level, the top of the Ekman layer, and 700-, 500-, and 200-mb levels. Operational charts plotted at the National Hurricane Center in Miami, Florida, were used as a base. These were subsequently reanalyzed at the National Climatic Center, Asheville, North Carolina, to include final BOMEX shipboard data. Also, where reports were sparse or infrequent, knowledge of general climatology and persistence was incorporated for fuller coverage. The charts were reviewed to improve continuity in time. Vertical consistency was checked, but difficult to define, since the upper air charts reflect streamline analyses.

COM-75-11088/2GA PC$4.75/MF$2.25
National Weather Service, Silver Spring, Md.
Some Climatological Characteristics of Hurricanes and Tropical Storms, Gulf and East Coasts of the United States.
Technical rept.,
Francis P. Ho, Richard W. Schwerdt, and Hugo V. Goodyear. May 75, 97p NOAA-TR-NWS-15 NOAA-75072305
Sponsored in part by Corps of Engineers, Washington, D.C. and Federal Insurance Administration, Washington, D.C.

Descriptors: *Hurricanes, *Tropical cyclones, *Storm surges, Wind(Meteorology), Meteorological charts, Probability theory, Meteorological data, Spatial distribution, Wind velocity, Gulf Coast region(United States), Atlantic Coast(United States).
Identifiers: Sea Grant program.

A climatology of hurricane factors important to storm surges is presented for the U.S. gulf and east coasts. A smoothed frequency of tropical storms and hurricanes entering and exiting the coast and storms passing within 150 nautical miles of the coast during the period 1871-1973 is given. The central pressure for hurricanes and tropical storms and the radius of maximum winds and speed of forward motion for hurricanes were obtained from data analysis. Directions of landfalling hurricanes and tropical storms at the time they crossed the coast at selected points were also analyzed. The probability distribution of each factor is plotted and analyzed for each 50 nautical mile interval along the coast. Selected probability levels of each distribution are then summarized, and smoothed variations along the coast are obtained by analysis. The speeds of motion for two classes of hurricanes (those that entered the coast and those that passed within 150 nautical miles of the coast) are studied separately and a smooth speed analysis is determined for each.

COM-75-90008-04/GA MF$2.25
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
Mariners Weather Log. Volume 19, Number 4, July 1975,
Elwyn E. Wilson. Jul 75, 75p NOAA-75072212
Paper copy available to persons or agencies with a marine interest from the Environmental Data Service, Page Bldg. 1 (D762), 2001 Wisconsin Ave., N.W. Washington, D.C. 20235.

Descriptors: *Tropical cyclones, *Weather forecasting, *North Pacific Ocean, Meteorological satellites, Hurricanes, Monsoons, Typhoons, Remote sensing, Storms, Philippines, Hawaii, Meteorological data, Meteorological charts, Radar images, Marine meteorology, Tables(Data).
Identifiers: Tropical Storm Olive, Hurricane Ione.

The issue of Mariners Weather Log presents information on tropical cyclones. It contains three articles: One on satellite imagery analysis of cyclone intensity and two on tropical cyclone activity in the Pacific Ocean during 1974, one for the western north Pacific and one for the central north Pacific. Contained in these articles are tables, charts, and data on the various individual tropical cyclones that occurred and an explanation of the interpretation of meteorological satellite imagery. Also included are regular features: Hints to the Observer, Tips to the Radio Officer, Hurricane Alley, On the Editor's Desk, Marine Weather Review, and Marine Weather Diary.

COM-75-90008-04-01/GA
(Order as COM-75-90008-04)
National Environmental Satellite Service, Washington, D.C.
Tropical Cyclone Intensity Analysis and Forecasting from Satellite Imagery,
Vernon F. Dvorak. Jul 75, 9p NOAA-75072212-1
Included in Mariners Weather Log, v19 n4 p199-206 Jul 75.

Descriptors: *Tropical cyclones, *Weather forecasting, Meteorological satellites, Radar images, Storms, Magnitude, Remote sensing, Clouds(Meteorology), Wind(Meteorology), Mathematical models, Patterns, Diurnal variations, Marine meteorology, Estimates, Spaceborne photography.

The report describes a systematic procedure for estimating tropical cyclone intensities using imagery from meteorological satellites. Two sets of cloud characteristics are analyzed, with guidance from a model of tropical cyclone change derived empirically from satellite data. One set of characteristics is used to estimate cyclone intensity. It is made up of three parameters: The central features which define the cloud system center and its relation to dense-overcast clouds; the outer banding features which curve around the central features; and the vertical depth of the clouds comprising these features. Intensity is considered to be related to the sum of the three parameters. The assessment of intensity is made in three stages. The first yields a modeled estimate of the cyclone's intensity; the second and third use the cloud pattern and feature measurements to verify or adjust the modeled expectation. The second set of cloud features is then analyzed to determine if an extrapolation along the cyclone's particular modeled curve is to be used for the 24-hour intensity forecast.

COM-75-90008-04-02/GA
(Order as COM-75-90008-04)
Fleet Weather Central/Joint Typhoon Warning Center, FPO San Francisco 96630.
Western North Pacific Typhoons, 1974,
Charles R. Holliday. Jul 75, 19p NOAA-75072212-2
Included in Mariners Weather Log, v19 n4 p207-224 Jul 75.

Descriptors: *Typhoons, *North Pacific Ocean, Tropical cyclones, Storms, Monsoons, Westerlies, Synoptic meteorology, Meteorological charts, Storm tracks, Weather forecasting, Philippines, Philippine Sea.

There was a sharp reversal, during 1974, from the abnormally light tropical cyclone activity observed during 1973. Named tropical cyclones numbered 32, 10% higher than the latest 15-year average. The number of typhoon days, however, numbered only 62, well below the 15-year average of 90 days, reflecting a tendency of this season's tropical cyclones not to develop beyond storm strength. No super-typhoons were observed during 1974, the first such occurrence since documentation began in 1959. One of the unusual synoptic features during August and September was the penetration of monsoon westerlies to more poleward latitudes than normal. By early October, however, the monsoon trough became reestablished near its normal position in the Philippine Sea, and triggered development of a series of destructive cyclones that crossed the Philippine Islands.

COM-75-90008-04-03/GA
(Order as COM-75-90008-04)
Fleet Weather Central/Joint Typhoon Warning Center, FPO San Francisco 96630.
Central North Pacific Tropical Cyclones, 1974,
Charles R. Holliday. Jul 75, 2p NOAA-75072212-3
Included in Mariners Weather Log, v19 n4 p224 Jul 75.

Descriptors: *Tropical cyclones, *North Pacific Ocean, Hurricanes, Patterns, Storms tracks, Synoptic meteorology, Weather forecasting, Seasonal variations.
Identifiers: Tropical storm Olive, Hurricane Ione.

The 1974 hurricane season in the central Pacific followed a pattern similar to that of recent years -- short, but active. In general, there also was a similarity in life cycle and track with previous years' storms.

DP-1387 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Dispersion of Small Particles in a Tornado.
D. W. Pepper. May 75, 23p
Contract AT(07-2)-1

Descriptors: (*Savannah river plant, *Meteorology), (*Tornadoes, *Forecasting), (*Surface air, *Turbulence), Diffusion, Particles, Statistics, Velocity, Wind.

For abstract, see NSA 32 03, number 06457.

N75-28600/7GA PC$3.25/MF$2.25
Materials Research Labs., Maribyrnong (Australia).
High Temperatures in Australia.
M. E. Redman, and J. A. Mcrae. Apr 75, 17p REPT-625

Descriptors: *Atmospheric temperature, *Australia, *High temperature, Meteorological parameters, Periodic variations.

For abstract, STAR 1317

N75-28603/1GA PC$3.25/MF$2.25
Institut Royal Meteorologique de Belgique, Brussels.
Climatological Observations Observations Climatologiques Bulletin Mensuel, Aout 1974.
Monthly Bulletin, Aug. 1974.
Aug 74, 15p
In French and Dutch.

Descriptors: *Belgium, *Meteorological parameters, *Synoptic meteorology, Atmospheric moisture, Beta particles, Fallout, Precipitation (Meteorology), Storms (Meteorology), Sunlight, Tables (Data), Wind (Meteorology).

For abstract, STAR 1317

PB-243 508/9GA PC$3.75/MF$2.25
Hawaii Univ., Honolulu. Water Resources Research Center.
Methodological Approaches in Hawaiian Fog Research.
Technical rept.,
James H. McKnight, and James O. Juvik. Mar 75, 40p TR-85 W75-09526, OWRT-A-041-HI(1)
Contract DI-14-31-0001-4011

Descriptors: *Fog, *Precipitation(Meteorology), *Hawaii, Moisture content, Hygrometers, Mountains, Particle size, Estimating, Networks, Mathematical models, Rainfall, Sampling, Meteorological instruments, Wind(Meteorology), Computer programs, Spatial distribution.

Recent studies have demonstrated the important moisture contribution from fog precipitation and mountain areas on the island of Hawaii. Research methodologies useful in the study of Hawaiian upslope fog, were investigated, including; (1) Development of an improved fog gage; (2) development of indirect approximation methods for estimating average droplet sizes during precipitation episodes and separating fog and rainfall components; (3) establishment of an extensive fog sampling network on the island of Hawaii employing continuous recording equipment, for both rain, fog, and wind; (4) development of an original computer program for detailed temporal and spatial analysis of rain, fog, and wind parameters.

PB-243 851/3GA PC$3.25/MF$2.25
Minnesota Agricultural Experiment Station, St. Paul.
Climate of Minnesota. Part VII. Areal Distribution and Probabilities of Precipitation in the Minneapolis-St. Paul Metropolitan Area,
Donald G. Baker, and Earl L. Kuehnast. 1973, 20p Technical Bull-293 W75-10009, OWRT-B-068-MINN(2)
Contract DI-14-31-0001-3901
See also PB-223 909.

Descriptors: *Climate, *Precipitation(Meteorology), Urban areas, Weather stations, Rainfall intensity, Diurnal variations, Rain gages, Probability theory, Spatial distribution, Statistical data, Airports, Minnesota.
Identifiers: Minneapolis(Minnesota), Saint Paul(Minnesota).

A study was made of the daily precipitation at 25 stations within a 30-mile radius of the Minneapolis-St. Paul airport from May-September for the five-year period 1964-1968. The frequency of daily rains of 0.01 inch or more indicated by a single gage was about 35% while in reality the frequency was closer to 65%. The number of gages required for a 'true' sample varies from about 45 in May and June to 60 in July. The area of a rain was generally least in July and greatest in June. The maximum daily rainfall recorded equalled 7.98 inches and the greatest total monthly rainfall was 11.85 inches. Precipitation was lower at the airport site.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-A013 627/5GA PC$5.75/MF$2.25
Naval Postgraduate School Monterey Calif
Management by Objectives at a Research, Development, Test and Evaluation Activity.
Master's thesis,
Larry Eugene Blose, and Michael Jerome Stansel. Jun 75, 130p

Descriptors: *Research management, *Management planning and control, Response, Attitudes(Psychology), Naval research laboratories, Engineers, Scientists, Production, Motivation, Feasibility studies, Theses.
Identifiers: *Management by objectives.

NAVMAT Instruction 5200.37 of 24 September 1973 required a Management by Objectives (MBO) program to be initiated throughout the Naval Material establishment. The Pacific Missile Range (PMR) at Point Mugu, California requested assistance from the Naval Postgraduate School in establishing their MBO program. A pilot MBO program was established at PMR to determine MBO's feasibility in a research and development (R and D) organization. Due to time constraints, the program was limited to the implementation of short range goals and objectives.

AD-A013 643/2GA PC$5.25/MF$2.25
Assistant Secretary of Defense (Manpower and Reserve Affairs) Washington D C
A Management Study Relating to NAFI Consolidation.
Final rept.
May 75, 103p

Descriptors: *Finance, *Management planning and control, Recreation, Organizations, Money, Control.
Identifiers: *Nonappropriated funds.

The report is a management study relating to the considerations and factors pertaining to the consolidation of nonappropriated fund instrumentalities (NAFIs). It provides necessary background material which shows a need for the study and measures taken by the military services to effect consolidation; discusses NAFIs as morale, welfare and recreation organizations; furnishes the factors affecting consolidation and options considered; provides feasible recommendations; and submits a standard glossary of terms.

AD-A013 647/3GA PC$3.25/MF$2.25
Shape Technical Center the Hague (Netherlands)
Design and Evaluation of Information Systems.
Professional paper,
W. R. O'Brien. Jun 75, 15p Rept no. STC-PP-107
NATO furnished.

Descriptors: *Research management, *Management information systems, Requirements, Management planning and control, Scientists, Group dynamics, Organization theory, Netherlands.

The objective of this paper is to bring forward some of the more significant characteristics of various management strategies and to assess their impact on the requirements of a laboratory management information system. The management strategies are classified according to three schools: the Classical, the Behavioral, and the Systems. The Classical is shown to have a 'top down' orientation, with management giving the orders and the working-level scientists being expected to carry them out. The Behavioral School puts great emphasis on the informal organization and the attitudes, sentiments, and interactions of the group members. The objective is to try to assure that the group members can achieve fulfillment by cooperating in the achievement of organizational goals. The Systems School integrates much of the theory of the other two, adding emphasis to the environment as well as organizational adaptation.

AD-A013 662/2GA PC$5.75/MF$2.25
Naval Postgraduate School Monterey Calif
An Examination of an SBA Contract Program to Aid Socially or Economically Disadvantaged Entrepreneurs and its Impact on the Navy Shore Facilities Construction and Maintenance Procurement System.
Master's thesis,
William Casy Hilderbrand, Frederick Joseph Jones, and Raymond Stewart Tyler. Jun 75, 140p

Descriptors: *Contract administration, *Maintenance management, *Construction, Naval shore facilities, Maintenance, Naval procurement, Contracts, Negotiations, Law, Minorities, Civilian personnel, Deficiencies, Selection, Training, Estimates, Costs, Alloca-

tions, Efficiency, Motivation, Cost effectiveness, Profits, Law enforcement, Policies, Modification, Effectiveness, Assessment, Theses.
Identifiers: Small Business Administration, Economic Impact, Small businesses, Civil rights, Contractors, Contract proposals.

This thesis examines the Small Business Administration (SBA) program to use the authority granted by section 8(a) of the 1958 Amendment to the Small Business Act to aid socially or economically disadvantaged persons, and its impact on the Navy shore facilities construction and maintenance procurement system. The origin of the SBA's 8(a) authority and the consistency of its present use with the intent of Congress in granting that authority is examined including court challenges to that use. The current operational procedures followed by the SBA and the Navy in obtaining and providing support for the program are described and evaluated. A proposed method for evaluation of the Navy's support to the 8(a) program, and in particular the support provided by the Naval Facilities Engineering Command is introduced. Recommendations for improvement in present operational procedures are presented and a possible alternative to the 8(a) program is discussed.

AD-A013 664/8GA PC$6.25/MF$2.25
Naval Postgraduate School Monterey Calif
A Design of a Personnel Training Information System for the U. S. Marine Corps.
Master's thesis,
Robert Anthony VanHouten, Jr., Robert Paul Hansen, and Robert Eugene Sonnenberg, Jr. Jun 75, 160p

Descriptors: *Management information systems, *Data management, Minicomputers, Networks, Military training, Marine Corps, Computer programs, Marine Corps personnel, Information exchange, Data bases, Input output processing, Programming languages, Logistics support, Records, Reports, Personnel development, Scheduling, Theses.
Identifiers: Marine Corps Training, Records management.

A personnel training information system is designed for use on minicomputers within the operational forces of the U. S. Marine Corps. The problem of maintaining and accessing training information is analyzed. A computerized system and the characteristics it must possess are defined. The data base is formulated, input requirements are stated, and software support is defined. Alternatives for software support, including three existing hardware and software minicomputer systems, are discussed. A concept for a minicomputer network is developed. The specific requirements for the exchange of training information within the network are analyzed. Emphasis is placed on integration with existing hardware and software systems. (Author)

AD-A013 782/8GA PC$3.25/MF$2.25
Office of Naval Research London (England)
Centralization and Vigor Part II: Organization and Funding of Research in France,
Philip L. Stocklin. 18 Jul 75, 25p Rept no. ONRL-R-11-75
See also report dated 26 Jun 75, AD-A013 770.

Descriptors: *Research management, *France, Planning, Centralized, Government(Foreign), Finance, Organizations.

French scientific activity is characterized by centralization of planning, administration and funding, together with a vigor resulting from a highly developed research infrastructure of cross-Ministry, interdisciplinary work flow and communication, together with a mix of longevity funding and specific project support. Major features of the current French National Plan, the Sixth Plan, are summarized as they affect research. National organization for research, centered on a controlling agency in the Ministry of Industry and Trade is outlined. Funding by Ministry and by field of research for 1974 is given, togehter with illustrations of organization and infrastructure including the computer industry and oceanography.

AD-A013 971/7GA PC$4.25/MF$2.25
TRW Systems Group Huntsville Ala
Air Defense Short-Term Prototype Missile Plan.
Final technical rept.,
D. L. DeHaven, K. C. Richards, and C. B. Valrand. 18 May 75, 60p Rept no. TRW-26988-6921-002
Contract DAAH01-75-C-0084

Descriptors: *Air defense, *Army planning, *Guided missiles, Methodology, Planning, Technology, Cost analysis, Performance, Army research.

The document describes a new methodology which has been developed for Air Defense Systems Technology Planning. This methodology includes modifications and additions to both the planning process and the formalized plan itself. The implementation of the new procedures, and associated planning tools, will result in a technology plan which is more responsive to the Army need for unified and defendable R and D goals and means for reaching these goals.

AD-A013 984/0GA PC$3.75/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Management Sciences Research Group
An Adaptive Production Planning Model for Seasonal Goods.
Technical rept.,
Esko A. Kervinen. Dec 74, 30p Rept nos. RR-355, WP-1-75-76

Descriptors: *Production control, Planning, Control theory, Stochastic processes, Theorems.
Identifiers: Demand(Economics), Continuous time systems.

A dynamic stochastic production planning model is developed for a single good that is sold only during a specified season. The problem is formulated as a continuous-time adaptive control problem, and a maximum principle is derived for the optimal solution. Some general properties of the optimal solution are discussed. The results are applied to a problem with quadratic production and inventory costs. Finally, a numerical example of the quadratic-cost problem is solved.

N75-26905/0GA PC$5.50
National Aeronautics and Space Administration, Washington, D.C.
Management: A Continuing Literature Survey with Indexes, March 1975.
Mar 75, 252p NASA-SP-7500(09)

Descriptors: *Abstracts, *Bibliographies, *Management, *Management methods, Management planning, Personnel management, Production planning, Quality control, Research management, Safety management.

For abstract, STAR 1317

PB-243 738/2GA PC$9.25/MF$2.25
Pennsylvania State Univ., University Park. Center for the Study of Science Policy.
Diffusion of Technology in State Mission-Oriented Agencies.
Final rept. 1 Jul 73-30 Oct 74,
Irwin Feller, Donald C. Menzel, and Alfred J. Engel. Oct 74, 305p* CSSP-PSU-08
Grant NSF-DA-39596
Prepared in cooperation with West Virginia Univ., Morgantown. See also PB-242 549.

Descriptors: *Technology innovation, *State government, Acceptability, Intergovernmental relationships, Organization theory, Technology utilization, Air pollution, Safety, Highways.

The report concerns the following research questions: (1) Is there any systematic tendency for some states to quickly adopt new technologies and for other states to lag behind; (2) what factors influence such a differential pattern of adoption; (3) do diffusion networks (leader-follower relationships) exist among mission agencies in different states. Data on date-of-adoption of two techniques were obtained from state highway departments (impact attenuators, computer modeling) and air pollution control agencies (air telemetry systems, computer modeling).

PB-243 804/2GA PC$17.25/MF$2.75
National Science Foundation, Washington, D.C. Office of Intergovernmental Science and Research Utilization.
Report of the OMB Study Committee on Policy Management Assistance. Volume III. Background Papers and Resource Materials,
Robert A. Shapek. Jun 75, 1168p NSF/RA/G-75/010
Paper copy of Volumes 1 and 2 from GPO.

Descriptors: *Technical assistance, *Federal programs, *Government policies, *Management engineering, Surveys, National government, State government, Local government, Reviews, Performance evaluation, Improvement, Management methods.
Identifiers: Science and technology development.

An interagency study committee on policy management assistance, comprised of career executives from the primary Federal agencies with an interest in Federal technical assistance to state and local governments was asked to assess current Federal technical assistance efforts and then to develop Federal strategies and options for strengthening state and local policy management capabilities. The Federal technical assistance effort was surveyed and agencies made presentations to the Committee. Non-Federal perspectives were acquired through a series of specially-commissioned studies -- including literature reviews, issue papers, and position papers. This volume is a compilation of those studies, as well as committee and staff working papers, and an extensive bibliography. Portions of this document are not fully legible.

PB-243 983/4GA PC$5.75/MF$2.25
Towers, Perrin, Forter and Crosby, Washington, D.C.
An Evaluation of the Employee Stock Ownership Plan as Applied to ConRail.
12 May 75, 146p USRA/R-064
Contract USRA-50108

Descriptors: *Participative management, *Financing alternatives, *Railroads, Stocks and bonds, Employees, Motivation, Evaluation, Ownership, Objective, Attitudes, Recommendations.
Identifiers: Employee stock ownership, Bankrupt railroads, Conrail System.

This study analyzes an employee stock ownership plan (ESOP) for Conrail as outlined in the Rail Reorganization Act. It considers corporate financing, employee motivation, employee stock ownership, and total compensation. In all four areas alternatives were considered.

Field 5—BEHAVIORAL AND SOCIAL SCIENCES

Group 5A—Administration and Management

PB-243 984/2GA PC$3.25/MF$2.25
National Science Foundation, Washington, D.C. Div. of Science Resources Studies.
Reviews of Data on Science Resources, No. 23, Research and Development Expenditures of State Public Institutions, Fiscal Year 1973.
Final rept.
May 75, 13p NSF-75-311

Descriptors: *Research and development, *State government, *Organizations, *Universities, Technology utilization, Plant expenditures, Cost analysis, Statistical data, Financing, Personnel, Information systems, Manpower.
Identifiers: State agencies.

The report contains data from the NSF report on R&D expenditures of state government agencies with data on R&D expenditures of state universities and colleges in order to gain perspective on the factors that contribute to economic and social change within the states. These combined expenditures amounted to $1,990 million in 1973 -- or 6.5 percent of the national R&D expenditures total of $30,427 million. Comparisons are given of the different conditions under which state government agencies and state universities conduct R&D programs and the different characteristics of their performance and funding sources. A number of detailed tables are included for study. R&D manpower is covered in addition to character of work, functional areas, and fields of science. A brief discussion of the means by which state agencies and state universities might work together better concludes the analysis.

5B. Documentation and Information Technology

AD-A013 967/5GA PC$4.75/MF$2.25
Air Force Systems Command Washington D C
Laboratory Program Managers Guide. Part I. Statement of Work Preparation.
Jun 75, 95p Rept no. AFSC-TR-75-02

Descriptors: *Technical writing, *Research management, Reports, Contract administration, Preparation, Purchasing, Contracts, Laboratories, Handbooks.

The primary objective of this guide is to provide laboratory level project engineers with a systematic approach for Statement of Work (SOW) preparation. The systematic approach presented should enable a project engineer to review and understand all factors that bear on this project BEFORE the Statement of Work is attempted. Statement of work review procedures are recommended to assist the project engineer identifying and correcting any gaps between what he intended to write and what he has actually written. The need and purpose for format consideration is also discussed.

COM-75-11142/7GA PC$6.25/MF$2.25
Patent and Trademark Office, Washington, D.C. Office of Technology Assessment and Forecast.
Technology Assessment and Forecast. Fifth Report.
Semiannual rept. no. 5.
Aug 75, 169p PAT-037.0-7508
See also report no. 4, dated Jan 75, COM-75-10050.

Descriptors: *Patents, *Foreign countries, *Technology development, Electrical industry, Chemical industry, Mechanical engineering, Vehicles, Time measuring instruments, Information systems, Textile industry, Electrophotography, Standard industrial classifications, Gas lasers.
Identifiers: Prostaglandins, Color electrophotography.

The two part report reviews the patent activity in 56 technological areas experiencing either high rates of growth or unusually heavy patenting by residents of foreign countries. Three of these areas -- Prostaglandins, color electrophotography, and gas lasers -- are the subjects of special substantive reports prepared by patent examiners in the respective fields. The report also presents patent activity data in 36 broad product field categories corresponding to the Standard Industrial Classification (SIC) System.

IRS-A-7(12-74) PC$9.25/MF$2.25
Institut fuer Reaktorsicherheit der Technischen Ueberwachungs-Vereine e.V., Koeln (F.R. Germany).
Institutions Establishing Rules and Enforcing Regulations.
W. Schlegel. Dec 74, 125p
In German. U.S. Sales Only.

Descriptors: (*German federal republic, *Regulations), (*France, Regulations), (*Canada, Regulations), (*Usa, Regulations), Legal aspects, United kingdom.

No abstract available.

N75-26917/5GA PC$4.25/MF$2.25
Alabama Univ., Huntsville. Center for Environmental and Energy Studies.
Feasibility of Using the Mirads Data Management System for a State Air Pollution Agency.
B. J. Schroer. 25 Jun 75, 71p NASA-CR-143878, UAH-RR-171
Contract NAS8-30885

Descriptors: *Alabama, *Computer programs, *Data management, *Pollution control, Feasibility analysis, System effectiveness.

For abstract, STAR 1317

PB-243 668/1GA PC$5.25/MF$2.25
National Archives and Records Service, Washington, D.C. Div. of Machine-Readable Archives.
A Study of Data Management Policies in Federal Scientific Data Centers.
Final rept.,
William A. Reader, and Jon E. Updike. Jun 75, 119p*

Descriptors: *Information centers, *Systems management, Cost analysis, Information systems, Data acquisition, Data processing, Information retrieval, Computer programming, Personnel, Manpower utilization, National government.
Identifiers: Federal agencies.

The report studies data management policies in the following five scientific data centers: National Oceanographic Data Center (NOAA), Earth Resources Observational System Data Center (Geological Survey), National Air Data Branch (EPA), National Space Science Data Center (NASA), and National Standard Reference Data System (National Bureau of Standards). The study describes and analyzes the history, mission and scope of operations, organization, staffing, data acquisition policies, data services, and costs for each center individually, and then makes comparisons between the centers in each of the above categories. The report seeks to determine the policies, procedures, practices, and costs of certain Federal agencies which market machine-readable data to the public and scientific communities.

PB-243 778/8GA PC$5.25/MF$2.25
Nebraska Univ., Lincoln. Water Resources Research Inst.
Water Resources Publications Related to the State of Nebraska. Third Edition.
May 75, 103p NWRRI-Pub-7 W75-10015, OWRT-A-999-NEB(16)
Contract DI-14-31-0001-5027

Descriptors: *Water resources, Documents, Bibliographies, National government, State government, Universities, Organizations, Coordination, Nebraska.

The report is the third edition of 'Water Resources Publications Related to the State of Nebraska' which lists water-related publications from Nebraska state, federal and university agencies and departments. The material provided should facilitate the exchange of information between the various organizations interested in Nebraska's waters. Complete author and key word indexes are contained in this third edition. Listings are cross-referenced whenever practical. The Table of Contents indicates major subdivisions of the bibliography: Federal agencies, State agencies, University of Nebraska, Chadron State College, Lower Platte South Natural Resources District, and Missouri River Basin Commission.

PB-243 827/3GA
Mag Tape $200.00;Foreign $250.00
Bureau of Labor Statistics, Washington, D.C. Office of Systems and Standards.
Table Producing Language (TPL), Version 3.5. Software,
Peter B. Stevens. Mar 75, 1 reel mag tape
BLS/DF-75/001
Available only in 9 track, 1600 bpi, odd parity, EBCDIC. Price includes documentation, PB-243 828 and PB-243 829.

Descriptors: *Software, *Statistical reports, *Programming languages, Tables(Data), Statistical data, Syntax, Methodology, Information systems, Data files, Management guidelines, Preparation, Computer programming, Magnetic tapes.
Identifiers: *Table producing languages, TPL computer system.

A national statistical agency usually produces the results of its surveys in tabular form at the cost of a substantial portion of its data processing resources. The tables are often quite complex with cross tabulations of irregular patterns of hierarchical data files with many intermediate levels of summarization, percentage distributions, measures of statistical precision, and intricate publication formats. The Table Producing Language (TPL), therefore, has been designed and implemented as a general tool for producing statistical tables. The expressions are problem oriented, nonprocedural, compact, and written with English-like nomenclature. Users need not have experience with computer programming languages.

PB-243 828/1GA PC$8.50/MF$2.25
Bureau of Labor Statistics, Washington, D.C. Office of Systems and Standards.
Table Producing Language Version 3.5 Users Guide, Including Print Control Language and Codebook Language,
Rudolph C. Mendelssohn. Jul 75, 251p*
BLS/DF-75/001a
See also PB-243 829 and data file on magnetic tape, PB-243 827.

Descriptors: *Statistical reports, *Programming languages, Statistical data, Tables(Data), Preparation, Problem solving, User needs, Data processing, Data displays, Computer programming, Information systems, Data files.
Identifiers: *Table producing languages, TPL computer system.

Table Producing Language (TPL) is a computer system designed to select, restructure, cross-

tabulate, and display statistical data. The system was designed to solve some problems connected with the collection of large volumes of data from which cross tabulations must be produced in a wide variety of formats. The economist, statistician, social scientist, or other subject matter analyst need not be dependent on a separate computer program for each table requested, a process which is often costly and time consuming. The primary goal of TPL is to provide the individuals who need tables with the option of obtaining these tables directly from the computer. Users need not have experience with conventional computer programming languages.

PB-243 829/9GA PC$3.75/MF$2.25
Bureau of Labor Statistics, Washington, D.C. Office of Systems and Standards.
The Development and Uses of Table Producing Language.
Final rept.,
Rudolph C. Mendelssohn. Mar 75, 25p* BLS-435 BLS/DF-75/001b
See also User's Guide, PB-243 828 and magnetic tape, PB-243 827.

Descriptors: *Statistical reports, *Programming languages, Tables(Data), Display devices, Statistical data, Computer programs, Information retrieval, Data files, Data processing, User needs, Systems engineering, Utilization, Methodology, Coding.
Identifiers: *Table producing languages, TPL computer system.

This is a report on the development and uses of a new Bureau of Labor Statistics computer program designed to reduce the time between collecting new survey data and processing the results in statistical tables. Key to the program is a new system of retrieving information from computer storage and processing it. The name given to the system is Table Producing Language (TPL). A TPL Users Manual is available to those who are interested in studying the table producing language and, perhaps, acquiring a copy of the complete system itself.

PB-244 327/3GA PC$5.25/MF$2.25
National Library of Medicine, Bethesda, Md. Bibliographic Services Div.
On-Line Services Reference Manual. Update I, July 1975.
Jul 75, 103p* NLM-MED-75-09
See also PB-240 126.

Descriptors: *Manuals, *Information retrieval, *Medicine, *Information systems, Search structuring, Instructions, Libraries.
Identifiers: *On line information retrieval, *Data bases, *Communication networks, *Biomedical information systems, NAME AUTHORITY FILE, MEDLINE, CATLINE, CANCERLINE, SDILINE.

The report provides replacement pages for portions of the National Library of Medicine's manual for the operation of various on-line data bases. Chapters on CATLINE, CANCERLINE, and the NAME AUTHORITY FILE have been rewritten to reflect the change from ELHILL 2 to ELHILL 3. Also extensive changes have been made in the Parts on SDILINE, BACKFILES and OFFSEARCH.

5C. Economics

AD-A014 004/6GA PC$17.00/MF$17.00
Battelle Columbus Labs Ohio Metals and Ceramics Information Center
The Titanium Industry in the Mid-1970's,
R. A. Wood. Jun 75, 89p Rept no. MCIC-75-26
Contract DSA900-75-C-1803

Descriptors: *Industries, *Titanium, Information, Ores(Metal sources), Porous metals, Melting, Metal scraps, Castings, Powder metals, Titanium alloys, Utilization, Forecasting.
Identifiers: *Metal industry.

Contents:
Titanium ores;
Titanium sponge;
Melting technology;
Titanium scrap;
Castings, mill products, and powdered titanium;
Titanium alloys;
applications and utilization;
--Forecasts.

AD-A014 037/6GA PC-GPO/MF$2.25-NTIS
American Univ Washington D C Foreign Area Studies
Area Handbook for Pakistan,
Richard F. Nyrop, Beryl Lieff Benderley, Cary Corwin Conn, William W. Cover, and Melissa J. Cutter. 1975, 457p DA-PAM-550-48
Library of Congress catalog card no. 75-619147. Supersedes AD-720 605.
Availability: Paper copy available from GPO as D101.22:550-48/3.

Descriptors: *Pakistan, *Handbooks, Economics, Political science, Sociology, Transportation, Public health.
Identifiers: *Area studies.

The volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The American University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future.

AD-A014 038/4GA PC-GPO/MF$2.25-NTIS
American Univ Washington D C Foreign Area Studies
Area Handbook for India,
Richard F. Nyrop, Beryl Lieff Benderly, William W. Cover, Melissa J. Cutter, and Newton B. Parker. 1975, 644p DA-PAM-550-21
Library of Congress catalog card no. 75-619051. Supersedes AD-716 204.
Availability: Paper copy available from GPO as D101.22:550-21.

Descriptors: *India, *Handbooks, Economics, Political science, Sociology, Transportation, Public health.
Identifiers: *Area studies.

The volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The Americal University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future.

AD-A014 039/2GA PC-GPO/MF$2.25-NTIS
American Univ Washington D C Foreign Area Studies
Area Handbook for Brazil,
Thomas E. Weil, Jan Knippers Black, Howard I. Blutstein, Kathryn Therese Johnston, and David S. McMorris. 1975, 486p DA-PAM-550-20
Library of Congress catalog card no. 75-8735. Supersedes AD-720 230.
Availability: Paper copy available from GPO as D101.22:550-20.

Descriptors: *Brazil, *Handbooks, Economics, Political science, Sociology, Transportation, National defense.
Identifiers: *Area studies.

The volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The American University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future.

COM-75-11023/9GA PC$3.25
Washington Univ., Seattle. Coll. of Fisheries.
Energy Efficiency in the Pacific Oyster Industry,
Sally Nickelson, and Stephen B. Mathews. May 75, 14p WSG-TA-75-4 NOAA-75070302
Grants NOAA-04-5-158-48, NSF-GY-11242
Pub. in paper presented at the Pacific Coast Section Meeting, National Shellfisheries Assoc., Sep 74.

Descriptors: *Oysters, *Willipa Harbor, *Fish economics, *Fish industry, Fish harvesting, Diesel fuels, Manpower, Fishing equipment, Merchant ships, Calorific value, Food supply, Seafood, Cost analysis, Efficiency.
Identifiers: Sea Grant program.

The energy efficiency of the Pacific oyster industry in Willipa Harbor was estimated by converting all manpower, fuel, vessel, machinery, and other inputs of production of a standard firm into kilocalories (kcal) and comparing this to kcal in the oyster meat. On an annual basis the ratio of kcal output to kcal of input was estimated to be 0.21. The level of efficiency was similar to that of other fishery industries, a surprising finding, since oyster culture requires neither artificial feeding nor traditional fishing. The diesel fuel used to plant, transplant, and harvest accounted for 85% of the input energy.

COM-75-11053/6GA PC$9.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1951,
A. W. Anderson, and C. E. Peterson. 1954, 345p
Statistical Digest-30 NOAA-75070309
See also COM-75-11056.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Fishing products, Value, Fishing equipment, Statistical data, Merchant ships, Byproducts, Commercial fishing, Shrimps, Perch, Salmon, Herrings, Tunas, United States.
Identifiers: Menhaden, Pilchard, Mackerel.

The report contains a review of the fishery statistics for the year 1951. These statistics include data on the volume of the catch of fishery products and their value, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and certain information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: The catch totaled 4,414,045,000 lbs. valued at $360,826,000 - a decrease of 10% in quantity over 1950 production but a 5% increase in value; there were record landings of shrimp, menhaden, and ocean perch plus a marked increase in salmon production; landings of California pilchard, Maine and Alaska herring, Pacific tuna, and Jack mackerel declined; menhaden catches broke all previous records; shrimp rose to an all-time high on the consumer market; per capita fish consumption totaled 11.5 lbs.

COM-75-11054/4GA PC$9.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1952,
A. W. Anderson, and E. A. Power. 1955, 349p
Statistical Digest-34 NOAA-75070308

See also COM-75-11053.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Fishing products, Value, Fishing equipment, Statistical data, Merchant ships, Byproducts, Commercial fishing, Shrimps, Perch, Salmon, United States.
Identifiers: Menhaden, Sardines, Mackerel.

The report contains a review of the fishery statistics for the year 1952. These statistics include data on the volume of the catch of fishery products and their value, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and certain information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: The catch totaled 4,418,442,000 lbs. valued at $360,135,000 - a slight increase in quantity and a slight decrease in value over 1951; menhaden and shrimp catches were records; catches of Pacific sardines, Pacific mackerel, ocean perch, and salmon were sharply reduced; shrimp was the most valuable fishery product taken in the U.S.; catches of salmon in the Pacific Coast states and Alaska decreased; Pacific sardine catches were off considerably both in quantity and value; per capita consumption of fishery products in the U.S. was 11.0 lbs.

COM-75-11055/1GA PC$9.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1953,
A. W. Anderson, and E. A. Power. 1956, 342p
Statistical Digest-36 NOAA-75070307
See also COM-75-11054.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Fishing products, Value, Fishing equipment, Statistical data, Merchant ships, Byproducts, Commercial fishing, Shrimps, Perch, Salmon, Tunas, Herrings, Oysters, United States.
Identifiers: Menhaden, Sardines, Mackerel, Anchovies.

The report contains a review of the fishery statistics for the year 1953. These statistics include data on the volume of the catch of fishery products and their value, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and certain information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: The catch totaled 4,467,960,000 lbs. valued at $352,275,000 - an increase of 50 million lbs. over 1952 but a decrease of $8 million; menhaden production broke all records; shrimp was the most valuable single item taken by fishermen; fisheries recording noticeable production decreases were ocean perch, salmon, tuna, sea herring, Pacific sardines, mackerel, and oysters; California catch of anchovies was the largest in history; per capita consumption of fishery products in the U.S. was 10.8 lbs.

COM-75-11056/9GA PC$12.00/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1950,
A. W. Anderson, and C. E. Peterson. 1953, 496p
Statistical Digest-27 NOAA-75070310

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Fishing products, Value, Fishing equipment, Statistical data, Merchant ships, Byproducts, Commercial fishing, Tunas, Shrimps, Salmon, United States.
Identifiers: Menhaden, Mackerel.

The report contains a review of the fishery statistics for the year 1950. It includes data on the volume of the catch of fishery products and their value, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: Catches of fishery products totaled 4,884,909,000 lbs. valued at $343,876,000 - both figures are slightly higher than 1949; there were record landings of tuna and tuna-like fishes; high production of menhaden continued; the shrimp fishery expanded in the Gulf Area; catches of salmon were down considerably as were catches of mackerel; per capita consumption of fishery products in the U.S. was 11.5 lbs.

COM-75-11057/7GA PC$11.25/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1954,
A. W. Anderson, and E. A. Power. 1956, 450p
Statistical Digest-39 NOAA-75070306
See also COM-75-11055.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Fishing products, Value, Fishing equipment, Statistical data, Merchant ships, Byproducts, Commercial fishing, Shrimps, Cod, Perch, Salmon, Tunas, United States.
Identifiers: Menhaden, Croakers, Haddock, Halibut, Mackerel, Sardines, Anchovies.

The report contains a review of the fishery statistics for the year 1954. These statistics include data on the volume of the catch of fishery products and their value, employment in the fisheries, quantity of gear operated, the number of fishing craft employed in the capture of fishery products, and certain information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: The catch of fishery products totaled 4,741,843,000 lbs. valued at $355,639,000 - an increase of 6% in quantity and 1% in value over the previous year; menhaden production established a new record; shrimp was the most valuable single item taken by fishermen; major foodfish that recorded noteworthy gains included: cod, croakers, haddock, halibut, Pacific mackerel, Atlantic ocean perch, Pacific sardines, salmon, Pacific tuna; catches of anchovies in California were less than half the record catch of the previous year; per capita consumption of fishery products was 10.7 lbs.

COM-75-11058/5GA PC$10.25/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1955,
A. W. Anderson, and E. A. Power. 1957, 378p
Statistical Digest-41 NOAA-75070306-1
See also COM-75-11057.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Byproducts, Commercial fishing, Employment, Marine fishes, Shrimps, Minnows, Tunas, Salmon, Perch, Flatfishes, Crabs, Cod, Oysters, United States.
Identifiers: Menhaden, Haddock, Halibut, Sardines.

The report contains a review of the fishery statistics for the year 1955. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, and certain information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: Catch of fishery products totaled 4,794,281,000 lbs. valued at $335,778,000 - a slight increase in volume over 1954 but a 6% decrease in value; record catches of menhaden were recorded; shrimp continued to provide the greatest revenue to U.S. fishermen; catches of sardines increased; tuna, salmon, Atlantic ocean perch, haddock, halibut, crabs, cod, and oysters declined; per capita consumption of fishery products was 10.2 lbs.; items consumed with respect to volume were tuna, salmon, sardines, haddock, shrimp, ocean perch, and cod.

COM-75-11059/3GA PC$12.00/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1956,
E. A. Power. 1958, 480p Statistical Digest-43
NOAA-75070305
See also COM-75-11058.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Byproducts, Commercial fishing, Employment, Marine fishes, Tunas, Salmon, Herrings, Flatfishes, Clams, Crabs, Catfishes, Shrimps, United States, Perch, Oysters.
Identifiers: Menhaden, Mackerel, Halibut, Haddock, Alewives, Anchovies, Bullheads, Flounder, Sardines.

The report contains a review of the fishery statistics for the year 1956. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, and information on the volume and value of the production of manufactured fishery products and byproducts. Historical catch statistics for all regions are also presented. Among the more important statistics: Total yield was 5,251,686,000 lbs. valued at $369,018,000 - both figures were records; record totals of menhaden were taken; tuna, Alaska-caught salmon, sea herring, and jack and Pacific mackerel registered sharp increases; Pacific halibut, haddock, clams, and crabs registered gains while alewives, anchovies, catfish, bullheads, and flounders made slight gains; Pacific sardines, ocean perch, oysters, and shrimp showed declines; per capita consumption of fishery products was 10.2 lbs.; principal items consumed were tuna, salmon, haddock, ocean perch, and shrimp; San Pedro, Ca. was the leading U.S. fishing port.

COM-75-11060/1GA PC$11.25/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1957,
E. A. Power. 1959, 433p Statistical Digest-44
NOAA-75070305-1
See also COM-75-11059.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Byproducts, Commercial fishing, Employment, Marine fishes, Salmon, Tunas, Perch, Shrimps, Minnows, Crabs, Herrings, Shellfish, United States.
Identifiers: Menhaden, Anchovies, Haddock, Sardines, Mackerel.

The report contains a review of the fishery statistics for the year 1957. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, and information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: Total yield in 1957 was 4,778,458,000 lbs. valued at $351,116,000 - down 9% in volume and 5% in value over 1956; sharp declines were recorded in the landings of menhaden, salmon, and tuna; catches of

anchovies, Atlantic ocean perch, haddock, Pacific sardines, and shrimp also fell off; crabs, sea herring, Pacific and jack mackerel, and otter-trawl caught industrial fish were taken in greater abundance.

COM-75-11061/9GA PC$11.25/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1958,
E. A. Power. 1960, 428p Statistical Digest-49
NOAA-75070304
See also COM-75-11060.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Byproducts, Commercial fishing, Employment, Marine fishes, Salmon, Tunas, Minnows, Oysters, Shellfish, Herrings, Flatfishes, United States.
Identifiers: Menhaden, Mackerel, Anchovies, Whiting, Sardines, Alewives.

The report contains a review of the fishery statistics for the year 1958 collected during 1958 and 1959. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, and information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: Yield of the commercial fisheries of the U.S. totaled 4,735,845,000 lbs. valued at $370,679,000, down 43 million lbs. from 1957 but up in value $20 million; decline in the catch was caused by sharp reductions in the catch of menhaden, Pacific and jack mackerel, Alaska herring, anchovies, whiting, and unclassified species taken for reduction and animal food; items taken in considerably greater volume than in 1957 were Pacific sardines, salmon, tuna, and alewives; 66 million lbs. of oyster meats were harvested, probably the smallest quantity taken in over 100 years.

COM-75-11062/7GA PC$11.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1959,
E. A. Power. 1961, 460p Statistical Digest-51
NOAA-75070107
See also COM-75-11061.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Byproducts, Commercial fishing, Tunas, Shrimps, Salmon, Herrings, Oysters, Crabs, United States.
Identifiers: Menhaden, Sardines, Mackerel, Anchovies, Halibut, Groundfish, Haddock.

The report contains a review of the fishery statistics for the year 1959. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, and information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: Total catch yielded 5.1 billion pounds, worth $346.1 million - volume was up, but value was down from 1958, average price paid to fishermen was 6.8 cents/lb.; menhaden continued to rank first in volume. Catches of principal fish from previous year were as follows: Tuna down sharply, shrimp up, salmon down, sardines down, jack and Pacific mackerel up, anchovies down, sea herring down, halibut up, groundfish up, haddock down, oysters down, crabs record catch.

COM-75-11063/5GA PC$12.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1960,
E. A. Power. 1962, 533p Statistical Digest-53
NOAA-75070108
See also COM-75-11062.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Food storage, Commercial fishing, Tunas, Shrimps, Herrings, Salmon, Crabs, Oysters, Whales, United States.
Identifiers: Menhaden, Groundfish, Halibut, Mackerel, Sardines, Anchovies, Otter trawl.

The report contains a review of the fishery statistics for the year 1960. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, and information on the volume and value of the production of manufactured fishery products and byproducts. Among the more important statistics: Total catch yielded 4.9 billion pounds, worth $353.6 million poundage was down, but value was up from 1959; average price to fishermen was 7.2 cents/lb.; menhaden continued to rank first in volume. Catches of principal fish from previous year were as follows: Menhaden up, tuna up, shrimp up, sea herring up, salmon up, groundfish up, halibut record catch, jack mackeral up, Pacific mackerel unchanged, sardines down, anchovies down, otter trawl down, crabs record catch, oysters down, whales down; imports for consumption accounted for $360 million and exports $44 million.

COM-75-11064/3GA PC$11.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1961,
E. A. Power. 1963, 464p Statistical Digest-54
NOAA-75070109
See also COM-75-11063.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Food storage, Commercial fishing, International trade, Crabs, Clams, Catfishes, Shellfish, Salmon, Tunas, Shrimps, Herrings, United States.
Identifiers: Menhaden, Bullheads, Mackerel, Haddock, Sardines, Scallops.

The report contains a review of the fishery statistics for the year 1961. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, information on the volume and value of the production of manufactured fishery products, data on cold storage freezings and holdings, and on foreign trade in fishery commodities. Among the more important statistics: The total catch yielded 5.2 billion lbs. valued at $362 million, a total exceeded only in 1956; average price paid per lb. to fishermen was 6.98 cents, the lowest since WWII, except for 1959, there were record catches of menhaden, king crabs, clams, catfish, bullheads, and sea scallops; there were substantial gains in landings of Pacific salmon, tuna, mackerel, and haddock; there were sharp declines in landings of shrimp, Atlantic and Pacific sea herring, and Pacific sardines.

COM-75-11065/0GA PC$11.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1962,
E. A. Power, and C. H. Lyles. 1964, 470p
Statistical Digest-56 NOAA-75070110
See also COM-75-11064.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Food storage, Commercial fishing, Shellfish, Tunas, Crabs, Clams, Flatfishes, United States.
Identifiers: Menhaden, Flounder.

The report contains a review of the fishery statistics for the year 1962. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, information on the volume and value of the production of manufactured fishery products, data on cold storage freezings and holdings, and on foreign trade in fishery commodities. Among the more important statistics: Catches yielded a record 5.4 billion lbs. worth a record $396 million; the catch was worth an average of 7.40 cents per lb.; items taken in record volume were bluefin tuna, menhaden, blue crabs, king crabs, surf clams, and yellowtail flounders.

COM-75-11066/8GA PC$12.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1963,
Charles H. Lyles. 1965, 526p Statistical Digest-57 NOAA-75070111
See also COM-75-11065.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Commercial fishing, Clams, Crabs, Cod, Herrings, Tunas, Shrimps, Oysters, United States.
Identifiers: Flounder, Groundfish, Haddock, Halibut, Mackerel, Menhaden, Sardines, Scallops.

The report contains a review of the fishery statistics for the year 1963. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, information on the volume and value of the production of manufactured fishery products, data on cold storage freezings and holdings, and on foreign trade in fishery commodities. Among the more important statistics: Total catch yielded 4.8 billion lbs., worth $377 million - both figures are down from 1962; average value was 7.78 cents per pound; record catches of flounders, clams, and crabs were taken. Catches of principle fish from previous year were as follows: groundfish down, haddock down, Atlantic cod down, halibut down, sea herring down, Pacific and jack mackerel down, menhaden down, sardines down, tuna up, crabs up, shrimp up, oysters up, and scallops down.

COM-75-11067/6GA PC$12.50/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1964,
Charles H. Lyles. 1966, 545p Statistical Digest-58 NOAA-75070112
See also COM-75-11066.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Food storage, Commercial fishing, Crabs, Clams, Salmon, Tunas, Shrimps, Herrings, Oysters, Whales, Lobsters, United States.
Identifiers: Flounder, Menhaden, Groundfish, Mackerel, Alewives, Halibut, Scallops.

The report contains a review of the fishery statistics for the year 1964. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery

products, information on the volume and value of the production of manufactured fishery products, data on cold storage freezings and holdings, and on foreign trade in fishery commodities. Among the more important statistics: Total catch yielded 4.5 billion pounds, worth $389.5 million - poundage is down, but total value is up from 1963; record landings of blue crabs, king crabs, clams, and yellowtail flounders were taken; per capita consumption was 10.5 pounds, down from 1963; Louisana led the U.S.in catch. Catches of principal fish from previous year were as follows: Menhaden down, salmon up, tuna down, crabs up, shrimp down, groundfish up, flounders down, sea herring down, Pacific and jack mackerel down, oysters up, alewives down, halibut down, whales up, lobsters up, scallops down, both volume and value of fishery imports were record.

COM-75-11068/4GA PC$17.25/MF$2.25
Bureau of Commercial Fisheries, Washington, D.C.
Fishery Statistics of the United States - 1965,
Charles H. Lyles. 1967, 760p Statistical Digest-59 NOAA-75070113
See also COM-75-11067.

Descriptors: *Fishing, *Fish harvesting, *Fish industry, Statistical data, Fishing products, Value, Fishing equipment, Merchant ships, Food storage, International trade, Commercial fishing, Shellfish, Crabs, Clams, Perch, Lobsters, Shellfish, Crayfishes, United States.
Identifiers: Groupers, Flounder, Swellfish, Whiting, Haddock, Scallops.

The report contains a review of the fishery statistics for the year 1965. These statistics include data on the volume and value of the catch of fishery products, employment in the fisheries, quantity of gear operated, number of fishing craft employed in the capture of fishery products, information on the volume and value of the production of processed fishery products, data on cold storage freezings and holdings, and on foreign trade in fishery commodities. Among the more important statistics: Commercial landings of fish, shellfish, and other forms of aquatic life totaled 4.8 billion lbs. worth a record $445.7 million; there were record landings of king crabs, surf clams, Pacific ocean perch, groupers, flounders, swellfish, spiny lobsters, king whiting, and fresh-water crawfish; record values for shrimp, salmon, crabs, northern and spiny lobsters, flounders, clams, haddock, sea scallops, and red snapper were recorded; per capita consumption of fishery products was 10.9 lbs.

PB-242 638/5GA
Mag Tape $217.50;Foreign $272.50
Mathematics and Computation Lab. (OP), McLean, Va.
Capital Stock Estimates, 1947-1971.
Data file,
Rod L. Renner. 1971, 3 reels mag tape MCL/DF-75/001
Supersedes Rept. no. DOD/DF-73/009.
Specify tape recording mode desired: 9 track, 800 or 1600 bpi, odd parity, EBCDIC; or 7 track, 556 or 800 bpi, odd or even parity, BCD. Price includes documentation, PB-238 730, PB-242 639 and AD-758 747.

Descriptors: *Data file, *Fixed investment, Manufacturing, Estimates, Magnetic tapes.

This file includes industry investment data and associated estimates of gross and net capital stock in current constant dollars for the period 1947-1971. The industry classification is the three digit SIC level for manufacturing and 1958 BEA interindustry study classification for the nonmanufacturing sectors. The capital estimates were made using the perpetual inventory method. The net stock estimates are based upon assumed depreciation function which accelerates over the life of the investment item. Investment life parameters were taken from Bulletin F, U.S. Department of the Treasury, adjusted to make the stock estimates equal the average book values reported to Census for 1962-64 for manufacturing sectors. For manufacturing sectors, the live parameters were adjusted using information from regulatory agencies and other sources. Separate estimates were prepared for stocks owned by the Federal Government and operated by private contractors. Public sector stock later sold to the private sector are given separately for manufacturing sectors and are included in the nonmanufacturing estimates.

PB-242 639/3GA PC$4.25/MF$2.25
Mathematics and Computation Lab. (OP), McLean, Va.
Capital Stock Measures of Selected Standard Industrial Classifications and Selected Input-Output Sectors. User's Guide,
Wayne Z. Lineburg. Mar 73, 58p MCL/DF-75/001b
For data file on magnetic tape, see PB-242 638.
See also AD-758 747 and PB-238 730.

Descriptors: *Fixed investment, *Industries, Estimates, Manufacturing, Computer programming, FORTRAN.
Identifiers: Perpetual inventory method, UNIVAC 1108 computers.

Annual measures of capital stocks used by private industrial sectors of the economy during the period 1947-1971 for non-manufacturing and the period 1947-1971 for manufacturing in detail of input-output sectors and in units of measure comparable over time were developed by this research project. The stocks measures were derived by the perpetual inventory method, i.e., by accumulating investment items at the end of the estimated life of the particular types of equipment and structures included. Section two of this manual describes how the file names in Appendix A relate to type and I/O sector and plant or equipment. Appendix A contains a table showing which file names are associated with which of the seventeen reels of magnetic tape, and the corresponding ordering number. Portions of this document are not fully legible.

PB-243 446/2GA PC$5.25/MF$2.25
Pennsylvania Univ., Philadelphia. Fels Center of Government.
Alternative Formula for General Revenue Sharing: Stability of Allocations.
Final rept. 1972-74,
Morton Lustig, and Lawrence W. Garrett. 15 Jun 75, 110p NSF/RA/S-75-018
Grant NSF-APR75-05276
Prepared in cooperation with Technology Management, Inc., Washington, D.C.

Descriptors: *Revenue sharing, *Allocations, State government, Local government, National government, Federal assistance programs, Financial assistance, Urban areas, Rural areas, Decision making.

The objective in this study is to devise and test formulae for limiting year to year fluctuations in revenue sharing allocations to individual governments. The criterion for choice among tested alternative formulae is mean and standard deviation of fluctuations. A test of constraints was performed in four states representing regional variations and different characteristics. Test constraints include: (a) Limiting upward and downward fluctuations by 10%; (b) limiting only downward fluctuations by 10%; (c) limiting downward fluctuations for only needy governments by 10%; (d) using an average of the data for the current and preceding periods on population, income, taxes, etc. to serve in allocating for the current year in order to smooth abrupt changes. Evaluations of constraints indicated that plus or minus 10% had the lowest mean and standard deviation (the criterion for choice of a best alternative). The plus or minus 10% constraint is therefore chosen for further testing nationwide in Part II of this study. The -10% constraint, although with a higher mean and standard deviation, is also chosen because it was a preferred alternative of local officials.

PB-243 458/7GA PC$7.00/MF$2.25
Center for Governmental Research, Inc., Rochester, N.Y.
General Revenue Sharing: Designing a Formula Which Does Not Discourage or Distort Local Variations in Financing and Delivering Services.
Final rept. 1972-74,
Barry Jesmer. 15 Jun 75, 188p* NSF/RA/S-75-016
Contract NSF-APR75-05247

Descriptors: *Revenue sharing, *Allocations, State government, Local government, National government, Federal assistance programs, Financial assistance, Urban areas, Rural areas.

The report recommends modifications in the formula which include these elements: (1) The replacement of the fixed state-local split by an element which adjusts the 'split' depending on the proportional fiscal burdens of the two levels of government within each state (providing more weight to locally raised revenues); (2) the replacement of the 'adjusted tax' element by a more comprehensive definition of revenue; (3) the removal of the 20% per capita minimum or floor (but retention of the 145% ceiling); (4) the adjustment of the intra-county allocation process so that townships are included in the same group as other units of local government (eliminating the present separate treatment of townships in the 21 states with such units). A 'composite modification' contains each of these individual formula element modifications. All of the proposed modifications satisfy certain selected goals: neutrality, data availability, and simplicity.

PB-243 464/5GA PC$7.00/MF$2.25
Missouri Univ., Kansas City.
State Responsibility for Public Services and General Revenue Sharing.
Formula goal no. 3 (Final) 1972-74,
G. Ross Stephens, and Gerald W. Olson. 15 Jun 75, 189p NSF/RA/S-75-015
Contract NSF-APR75-05116

Descriptors: *Revenue sharing, *Services, *State government, Welfare economics, Local government, National government, Federal assistance programs, Allocations, Financial assistance.

The basic focus of this research is the development of formula recommendations that adjust the present one-third state/two-thirds local split of General Revenue Sharing monies in a manner that fits the state/local division of responsibility for the delivery of public services. Responsibility for service delivery is interpreted to mean the division between state and local governments in terms of (1) which level pays for public services and (2) which level operates the service delivery system, or combinations thereof.

PB-243 520/4GA PC$4.75/MF$2.25
North Carolina Univ., Chapel Hill. Dept. of Economics.
The Impact of Alternative Interpretation of the Floor and Ceiling Provisions of the State and Local Fiscal Assistance Act of 1972.
Final rept. 1972-1974,
Robert P. Strauss. 15 Jun 75, 87p Working Paper-75-4-6 NSF/RA/S-75-017
Grant NSF-APR74-22662
Continuation of Grant No. NSF-SSH74-22662.

Descriptors: *Revenue sharing, *Allocations, State government, Local government, National government, Federal assistance program, Financial assistance, Urban areas, Rural areas.
Identifiers: State and Local Fiscal Assistance Act.

The purpose of this study was to examine the effects of alternative interpretations of the floor and ceiling provisions of the State and Local Fiscal Assistance Act (general revenue sharing). The principal finding of the study is that two alternatives, which do not apply the 20% constraint in situations where there are insufficient funds within a county area to raise all units to it, provide smaller grants to Midwest townships and tend to improve the relationship in most states between per capita grants and tax effort and per capita income. The second principal finding of the study is that raising the ceiling to 175%, as recently proposed by the Ford Administration, does not unambiguously aid large cities. Of the top 50, more than 2/3 will not be better off. Third, the two alternatives which lessen the Midwest township problem also provide larger 'bonuses' to state governments.

PB-243 579/0GA PC$9.25/MF$2.25
Energy Resources Co., Inc., Cambridge, Mass.
A Study of the Impact of Reduced Retail Store Operating Hours on Sales, Employment, Economic Concentration, and Energy Consumption.
Final rept.
22 Oct 74, 309p* FEA/D-74/246R, FEA/D-CP-7
Contract DI-14-01-0001-1718

Descriptors: *Retail stores, *Regulations, *Energy conservation, *Electric power consumption, Reviews, Feasibility, Legislation, Employment, Disturbances, Public relations, Retail sales, Consumer purchasing, Retail trade, Economic impact.
Identifiers: *Commercial hours regulation.

The project was undertaken to analyze the possible impacts of government regulation of retail selling hours on sales, employment, economic concentration and energy consumption. Specific major results provide: (1) Estimates of energy savings which may accrue from regulating retail selling hours; (2) scenarios of regulatory schemes deemed economically and socially feasible; (3) analysis of likely economic retail hours; (4) statement of the least disruptive hours of closing if regulations on commercial hours were to be introduced.

PB-243 637/6GA PC$12.25/MF$2.25
Federal Power Commission, Washington, D.C.
Statistics of Privately Owned Electric Utilities in the United States, 1973. Classes A and B Companies.
Jul 75, 502p* FPC-S-247
See also PB-242 962.

Descriptors: *Electric utilities, Statistics, Econometrics, Assets, Expenses, Revenue, Liabilities, Income, Capital, Fixed investment, Electric power plants, Rates(Costs), Statistical data.

The publication presents, for the 37th consecutive year, comprehensive financial and operating information on all large privately owned electric utility companies operating in the United States, including Hawaii and Alaska. These utilities represent nearly 100 percent of the privately owned sector of the nation's electric power industry, on the basis of both assets and revenues, and accounted for 78.1 percent of the total generation of electric energy in the U.S. in 1973.

PB-243 657/4GA PC$6.25/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
General Revenue Sharing Formula Alternatives.
Final rept. 1972-74,
Reese C. Wilson, David H. Kaskowitz, William C. Grindley, and Donato A. D'Esopo. 15 Jun 75, 174p NSF/RA/S-75/014
Grant NSF-C-982

Descriptors: *Revenue sharing, *Allocations, State government, Local government, National government, Federal assistance programs, Financial assistance, Urban areas, Rural areas.

SRI adopted two goals for modifying the current General Revenue Sharing formula: (1) better allocation of funds among local governments according to the magnitude of their responsibilities and functions and (2) more assistance to jurisdictions with the greatest needs. The GRS formula alternative preferred by SRI to meet these goals includes the following changes - substitute adjusted revenues for adjusted taxes - make allocations to Indian tribes and Alaskan villages at the national and state levels - eliminate the county area allocation stage - raise the 145% constraint to 300% and eliminate the 20% constraint - decrease the 50% constraint to 20%. The revised formula raises allocations on the average to large cities.

PB-243 831/5GA PC$4.75/MF$2.25
Public Interest Economics Center, Washington, D.C.
Influence of Environmental Considerations on Agricultural and Industrial Decisions to Locate Outside the Continental United States.
Final rept.,
Anthony Yezer, and Amy Philipson. 1974, 93p*
EQ-4AC026II
Contract EQ4AC026

Descriptors: *Industries, *Economic impact, *Pollution control costs, *Relocation, Prices, Agricultural products, International trade, Air pollution, Water pollution, Pesticides, United States.

This study attempts to determine the implications for patterns of output of environmental regulations. Presumably, government regulations concerning discharges of pollutants into the air and water, or use of pesticides, can impose explicit or implicit costs on firms located in the U.S. Since these costs may not be experienced by firms in other countries, the resulting change in production costs, translated into changes in relative prices, tends to influence patterns or production -- reducing U.S. exports and/or increasing U.S. imports. Nothing in the process described here implies movements by individual firms. Although there may be some changes that involve investment patterns of individual corporations, output effects considered here might simply involve expansion of foreign firms. The environmental regulations considered here include the following three categories: Emissions regulated under the Clean Air Act as amended; Discharges regulated under the Federal Water Pollution Control Act as amended; Selected pesticides for which controls have been enacted or proposed.

PB-243 846/3GA PC$5.25/MF$2.25
Fairleigh Dickinson Univ., Teaneck, N.J. Dept. of Economics.
Construction and Economic Development. A Case Study and International Comparisons of Productivity.
Final rept.,
Peter J. Cassimatis. Aug 75, 106p FDU/DE-75/01

Descriptors: *Economic development, *Developing countries, *Construction industry, Construction practices, Economic surveys, Greece, Technological advances, Econometrics, Economic models, Interindustry economics, Employment profiles, Earnings, Comparative studies, Productivity, Foreign countries, Demand(Economics), National economy.

The relationship of construction and aggregate economic activity is the subject of this study with particular emphasis on the role of the construction industry plays in the growth of a developing country (Greece). The report analyzes the demand characteristics of construction, based on econometric equations, interindustry relationships, employment and earnings. Calculations show the relative share of construction in the national economy and comparisons are made of construction productivity with other industries of the United States and 12 OECD countries.

PB-243 926/3GA PC$4.75/MF$2.25
Chase Econometric Associates, Inc., Bala Cynwyd, Pa.
An Econometric Model to Forecast Price Increases for the Rail and Motor Truck Industries.
5 May 75, 80p* USRA/R-061
Contract USRA-50116
Supersedes PB-239 020.

Descriptors: *Economic models, *Price increases, *Railroads, *Truck industry, Economic forecasting, Economic analysis, Truck tractors, Fuel taxes, Insurance, Cost estimates, Econometrics, Inflation(Economics), Materials, Labor, Financial planning.

The report summarizes the economic outlook to 1985 for the U.S. using factors such as population, GNP, and labor. It includes equations pertinent to facets of the railroad industry, and develops projections for future prices, costs, interest rates, revenue, benefits taxes, employment and others.

5D. History, Law, and Political Science

AD-A013 894/1GA PC$3.25/MF$2.25
Illinois Univ At Urbana-Champaign Coordinated Science Lab
Formulation of Richardson's Model of Arms Race from a Differential Game Viewpoint,
M. Simaan, and J. B. Cruz, Jr. Sep 73, 13p
AFOSR-TR-75-1217
Grants AF-AFOSR-2570-73, NSF-GK-36276
Availability: Pub. in Review of Economic Studies, v42 n1 p67-77 Jan 75.

Descriptors: *Arms control, *Weapons, Models, Nations, International relations, Economics, Political science, Reprints.
Identifiers: *Arms race, Armament buildup, Richardson method, Differential games.

In this paper, the problem of armament buildup between two nations, each seeking an armament expenditure policy to maximize its objective function, has been formulated as a differential game problem, and the Nash strategy has been suggested as a possible solution concept for the problem. It is also shown that if the objective functions of both nations are quadratic, then the closed-loop Nash policies reduce the system to the same structure as the well known Richardson's models of arms race. This formulation is therefore suggested as a possible procedure for determining the coefficients in Richardson's model based on a choice of the parameters in the quadric objective functions. Some results concerning the stability of the model for an infinite horizon problem are also pointed out. (Author)

AD-A013 979/0GA PC$3.25/MF$2.25
Army War Coll Strategic Studies Inst Carlisle Barracks Pa

Deterrence and Detente.
Military issues research memo.,
John F. Scott. 30 Jul 75, 22p

Descriptors: *International relations, Relaxation, Deterrence, Military strategy.
Identifiers: *Detente.

An emphasis of deterrence during detente is inevitable because of mutual suspicions. The structure and strategy of a deterrent is logically interdependent with detente. Policies of 'rational-irrationality'--commitments to defend areas of little interest in order to support deterrence in areas of great interest--can dissipate detente or even encourage wars. The paper's thesis is that deterrence is defined too narrowly--in military terms--when incentives as well as threats to shape an adversary's choices.

COM-75-11032/0GA PC$7.00/MF$2.25
New York Sea Grant Inst., Albany.
Coastal Zone Legal References (Selected) 1975.
NYSG Law Center reference 1,
Robert I. Reis. Jun 75, 176p* NYSSGP-LS-75-014 NOAA-75070115
Prepared in cooperation with State Univ. of New York at Buffalo. Faculty of Law and Jurisprudence.

Descriptors: *Law(Jurisprudence), *Coasts, *Documentation, Natural resources, Marine resources, Water law, Legislation, Reviews, Environmental impacts, Regulations, Coastal zone management, Statutes, Ocean waves, Wind(Meteorology), Continental shelves, Estuaries, Swamps, Tidewater, Beaches.
Identifiers: Sea Grant program, Salt marshes, Wetlands.

The collection of legal references was initiated to give ten Sea Grant Law Fellows a beginning point for their research. It became evident as materials were being collected that a more extensive effort might profit others as well. Such an effort would serve as a basis for reorganizing research patterns to allow substantial additions to the next edition and a finer definition of functional categories. The resulting publication contains an expanded list of legal references applicable to various aspects of the coastal zone. Broad categories include the Make Up of the Coastal Zone, Competing Interests, Impact on Coastal Zone Dynamics, Coastal Zone Regulations, and The Coastal Zone - States.

PB-244 203/6GA PC$7.00/MF$2.25
Department of Transportation, Washington, D.C. Office of Facilitation.
Cargo Liability Study.
Final rept. 1974-75.
Jun 75, 196p* DOT/OS-7501

Descriptors: *International trade, *Domestic shipping, *Cargo transportation, *Liabilities, Common law, Legislation, Industry groups, Cooperation, Liability insurance, Common carriers, Intermodal shipping, Freight loss, Damage, Delay time, Claims, Cost estimates, Litigation.
Identifiers: *Cargo liability, DOT/5K, DOT/2G, DOT/1C.

The study was undertaken to broaden the understanding of today's cargo liability system in order that future domestic legislation and international conventions may better serve the needs of commerce. The study was carried out under the overall guidance of the office of Facilitation and coordinated with concerned segments of the Federal government, private industry, and international organizations concerned with the movement of intermodal cargo.

5E. Human Factors Engineering

AD-A013 707/5GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
The Physiologic Effects of Seat Back Angles < 45 Deg (From the Vertical) Relative to G.
Final rept. Jul 74-Feb 75,
R. R. Burton, P. F. Iampietro, and S. D. Leverett, Jr. 1975, 13p Rept no. SAM-TR-75-257
Availability: Pub. in Aviation, Space and Environmental Medicine, p887-897 Jul 75.

Descriptors: *Man machine systems, *Human factors engineering, *Aircraft seats, Angles, Physiological effects, High acceleration, Loads(Forces), Tolerances(Physiology), Jet fighters, Aerial warfare, Maneuvers, Simulation, Reprints.
Identifiers: F-15 aircraft, YF-17 aircraft, YF-16 aircraft, F-16 aircraft, F-17 aircraft, Comfort.

Seat back angles of 13 deg, 18 deg, and 30 deg from the vertical are found respectively in the F-15, YF-17, and YF-16 fighter aircraft. Theoretically, the reasons for the departure from the standard 13 deg seat by the YF-16 and 17 are increases in pilot comfort, target visibility, performance, and G tolerance. The following objective and subjective physiologic parameters were examined relative to seat back angles of 23 deg, 28 deg, and 40 deg (seat angle +10 deg angle of attack); heart rate and rhythm; arterial oxygen saturation; performance; intrathoracic (esophageal) pressure; arterial pressure; and, subject evaluation of comfort, effort, and fatigue. Eight experimental subjects from the USAF School of Aerospace Medicine (SAM) and four YF-16/17 test pilots were exposed to a simulated aerial combat maneuver (SACM) which included 12 s of 8 G. Relaxed and straining high sustained G (HSG) tolerances (6 G for 60 s) were also determined using only SAM subjects. The advantages of the 30 deg seatback angle during the SACM included increased subject comfort, less fatigue and effort, a statistically significant reduction in the increased mean heart rate associated with G exposure, and greater pilot acceptance. On the other hand, a statistically significant reduction in arterial oxygen saturation was found during the SACM at 40 deg compared with the 23 deg back angle although this seat back angle difference was not found during the HSG exposures. An increase in relaxed G tolerance was found with the 40 deg seat back angle--statistically significant only compared with the 28 deg seatback angle.

AD-A013 821/4GA PC$3.25/MF$2.25
Human Engineering Lab Aberdeen Proving Ground Md
An Analysis of the Divergence between Objective Data and Subjective Opinion of the Combat Effectiveness of Tracer Ammunition.
Final rept.,
John M. Jordan. Jun 75, 11p Rept no. HEL-TN-8-75

Descriptors: *Human factors engineering, *Tracer ammunition, Gunners, Firing tests(Ordnance), Performance(Human), Combat effectiveness, Army training, Experimental design, Infantry, Doctrine, Judgement(Psychology), Experimental data, Validation, Gunnery, Stress(Psychology), Aiming, Feedback, Methodology.
Identifiers: Subjective judgement.

An analysis was conducted of the subjective opinions and objective performance data gathered by this Laboratory in its program of research concerning the combat effectiveness of tracer ammunition. The purpose of the analysis was to formulate an explanation for the difference between the objective and subjective data. The explanation is presented in the form of three hypotheses, and data supporting each are analyzed. The difference in the data is attributed to an alleged discrepancy between infantry doctrine and the behavior of infantrymen under the stree of combat.

N75-26835/3GA PC$7.00/MF$2.25
Advisory Group for Aerospace Research and Development, Paris (France).
A Review of Anthropometric Data of German Air Force and United States Air Force Flying Personnel, 1967 - 1968.
H. J. Grunhofer, and G. Kroh. Apr 75, 180p
AGARD-AG-205, AGARDOGRAPH-205

Descriptors: *Anthropometry, *Armed forces, *Body size (Biology), Data correlation, Flight crews, Flying personnel, Germany, Human factors engineering, Males.

For abstract, STAR 1317

N75-26851/0GA PC$4.75/MF$2.25
Essex Corp., Huntsville, Ala.
Earth Orbital Teleoperator Manipulator System Evaluation Program.
M. Kirkpatrick, Iii, N. L. Shields, Jr., P. N. Frederick, R. Brye, and T. B. Malone. Feb 75, 84p NASA-CR-143874, REPT-2
Contract NAS8-30545

Descriptors: *Orbital assembly, *Remote handling, *Space maintenance, *Teleoperators, Data links, Earth orbits, Human factors engineering, Man machine systems, Manipulators, Remote consoles.

For abstract, STAR 1317

N75-26852/8GA PC$4.75/MF$2.25
Essex Corp., Huntsville, Ala.
Earth Orbital Teleoperator Visual System Evaluation Program.
N. L. Shields, Jr., M. Kirkpatrick, Iii, P. N. Frederick, and T. B. Malone. Feb 75, 85p NASA-CR-143875, REPT-3
Contract NAS8-30545

Descriptors: *Manipulators, *Performance, *Teleoperators, *Visual tasks, Design analysis, Man machine systems, Systems engineering.

For abstract, STAR 1317

5G. Linguistics

AD-A013 583/0GA PC$6.25/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
A New Time-Domain Analysis of Human Speech and Other Complex Waveforms.
Doctoral thesis,
Janet MacIver Baker. May 75, 158p AFOSR-TR-75-1083
Contract F44620-73-C-0074, ARPA Order-2466

Descriptors: *Speech recognition, *Acoustics, Time domain, Phonology, Waveforms, Frequency, Automation, Music, Animals, Sound, Computer programming, Theses.

The purpose of this research is to explore the usefulness of a new time-domain analysis of complex waveforms, especially with respect to human speech. Essentially three separate investigations are presented, with the last two predicated on the results of the first: (1) Cycle-based time-domain parameters were extracted from the speech waveforms of many hundreds of utterances, and were then subjected to extensive scrutiny, both by hand and by machine. (2) Based solely on time-domain phenomena

found in the previous study, the authors wrote an automatic segmentation program for continuous speech. (3) They examined the time-domain acoustic characteristics of 228 allophones of fricatives and stop consonants, for each of three speakers (2 males, 1 female). Finally, they present a personal view of the synergism inherent in the utilization of these time-domain techniques with the traditional frequency-domain techniques. In addition, suggestions are presented for applying these generalizable time-domain techniques to other complex waveforms, especially amenable to such analysis. Specific examples are drawn from music (e.g. violin) and animal (e.g. boubou shrike) vocalizations.

AD-A013 941/0GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
A System for Acoustic-Phonetic Analysis of Continuous Speech.
Journal article,
Clifford J. Weinstein, Lee F. Mondshein, Stephanie S. McCandless, and Victor W. Zue.
29 Mar 74, 15p Rept no. MS-3713 ESD-TR-75-188
Contract F19628-73-C-0002, ARPA Order-2006
Availability: Pub. in IEEE Transactions on Acoustics, Speech and Signal Processing, vASSP-23 n1 p54-67 Feb 75.

Descriptors: *Speech analysis, *Phonetics, *Speech recognition, Automatic, Phonemes, Acoustic properties, Speech, Signal processing, Vowels, Continuity, Algorithms, Linguistics, Spectrum analysis, Parametric analysis, Classification, Reprints.
Identifiers: Formant analysis.

A system for acoustic-phonetic analysis of continuous speech is being developed to serve as part of an automatic speech understanding system. The acoustic system accepts the speech waveform as an input and produces as output a string of phoneme-like units referred to as acoustic phonetic elements (APELs). The initial phase of the acoustic analysis consists of signal processing and parameter extraction, and includes spectrum analysis via linear prediction, computation of a number of parameters of the spectrum, and fundamental frequency extraction. This is followed by a preliminary segmentation of the speech into a few broad acoustic categories and formant tracking during vowel-like segments. The next phase consists of more detailed segmentation and classification intended to meet the needs of subsequent linguistic analysis. The preliminary segmentation and segment classification yield the following categories: vowel-like sound; volume dip within vowel-like sound; fricative-like sound; stop consonants, including silence or voice bar, and associated burst. These categories are produced by a decision tree based upon energy measurements in selected frequency bands, derivatives and ratios of these measurements, a voicing detector, and a few editing rules.

AD-A013 943/6GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
An Algorithm for Automatic Formant Extraction Using Linear Prediction Spectra.
Journal article,
Stephanie S. McCandless. 16 Jul 73, 8p Rept no. JA-4244 ESD-TR-75-190
Contract F19628-73-C-0002, ARPA Order-2006
Availability: Pub. in IEEE Transactions on Acoustics, Speech and Signal Processing, vASSP-22 n2 p135-141 Apr 74.

Descriptors: *Speech analysis, *Vowels, Signal processing, Algorithms, Speech, Frequency, Amplitude, Spectrum analysis, Speech recognition, Continuity, Peak values, Segmented, Mathematical prediction, Linear programming, Reprints.
Identifiers: Formant analysis.

An algorithm is presented which finds the frequency and amplitude of the first three formants during all vowel-like segments of continuous speech. It uses as input the peaks of the linear prediction spectra and a segmentation parameter to indicate energy and voicing. Ideally, the first three peaks are the first three formants. Frequently, however, two peaks merge, or spurious peaks appear, and the difficult part is to recognize such situations and deal with them. The general method is to fill formant slots with the available peaks at each frame, based on frequency position relative to an educated guess. Then, if a peak is left over and/or a slot is unfilled, special routines are called to decide how to deal with them. Included is a formant enhancement technique, analogous to a similar technique which has been implemented via the chirp-z transform, which usually succeeds in separating two merged formants. The algorithm has been implemented at Lincoln Laboratory on the Univac 1219 and the Fast Digital Processor, a programmable processor, and has been tested on a large number of unrestricted sentences.

5H. Man-Machine Relations

AD-A013 619/2GA PC$4.25/MF$2.25
Edo Corp College Point N Y Government Products Div
Design Study for a Head Sensor.
Final rept.,
H. S. Antman, and L. Czapla. 15 Feb 74, 71p Rept no. EDO-10191
Contract DAAA25-73-C-0628

Descriptors: *Tracking, *Visual targets, *Servomechanisms, Control systems, Headgear, Monitoring, Pilots, Army aviation, Weapon systems, Acoustic equipment, Transducers, Line of sight, Helmets.
Identifiers: Visually coupled control systems, Helmet angle sensing.

Helmet angle sensing is a requisite for tracking the pilot's head position and placing him in the loop of a visually coupled control system. This servo system slaves a weapon to the pilot's line-of-sight (LOS) and enables him to track the target with his hands free, to keep his head up and to maintain eye contact with the target. The technique enables complete coverage and unrestricted linear movement of the pilot's head within the spherical region of the Army AH-1G and AAH aircraft and allows unobstructed safe breakaway.

AD-A013 838/8GA PC$5.75/MF$2.25
Hughes Aircraft Co Culver City Calif Display Systems and Human Factors Dept
Binocular Rivalry in Helmet-Mounted Display Applications.
Final technical rept. Apr 73-Aug 74,
M. L. Hershberger, and D. F. Guerin. Jun 75, 146p Rept nos. HAC-P74-417R, HAC-Ref-C7622 AMRL-TR-75-48
Contract F33615-73-C-4145

Descriptors: *Head up displays, *Visual perception, Helmets, Human factors engineering, Images, Visual acuity, Transfer functions, Modulation.
Identifiers: *Binocular rivalry, Helmet mounted displays.

A research program was conducted to determine the relationships between helmet-mounted display (HMD) design parameters and binocular rivalry. A screening study which investigated 12 parameters was then conducted to determine which parameters affected binocular rivalry with HMDs. A parametric study was next conducted to establish functional relationships between HMD parameters and binocular rivalry for the parameters identified in the screening study to have a major impact on binocular rivalry. The final laboratory study was a validation study which compared selected HMD system configurations in realistic HMD and non-HMD tasks for binocular rivalry effects. The image quality analysis evaluated the effects of ambient illumination, display luminance, combiner transparency, and angular display subtense on HMD video image quality using modulation transfer function analysis techniques.

5I. Personnel Selection, Training, and Evaluation

AD-A013 586/3GA PC$7.00/MF$2.25
American Institutes for Research Silver Spring Md
Results of Field Survey to Evaluate an Experimental Set of Officer Duty Modules.
Final technical rept.,
John D. Sitterson, Jr., and Joseph O. Wintersteen. Jan 74, 177p Rept no. AIR-38400-1/74-TFR
Contract DAHC19-73-C-0042

Descriptors: *Job analysis, *Officer personnel, *Army personnel, Computer applications, Personnel management, Management information systems, Infantry, Statistical processes.
Identifiers: Duty modules.

Field surveys were conducted for the Army to test and evaluate an experimental set of 93 modules for representative jobs to which Infantry and Quartermaster officers are assigned. The results were analyzed, assisted by automatic data processing and including cluster analysis. Most of the modules were validated. The duty modules used, with the addition of new specialized modules as required, may suffice as a basis for further field surveys and evaluations involving officers of other branches of the Army.

AD-A013 623/4GA PC$4.25/MF$2.25
Naval Postgraduate School Monterey Calif
Feasibility Study for Establishing an Automated Data Base System for Naval Electronics Engineering Center, Vallejo.
Master's thesis,
James Edward Tarver. Jun 75, 66p

Descriptors: *Data management, *Salaries, *Contracts, Automation, Computer programming, Data banks, Personnel management, Feasibility studies, Theses, Systems analysis.

The purpose of the feasibility study is to establish an automated data base system for Naval Electronics Engineering Center, Vallejo, California. The three divisions, namely, the financial, procurement and program manager's divisions, were analyzed as a separate entity by taking their present methods of operation and determining which methods lend themselves to automation and propose a conceptual EDP system to handle the new data structure. After combining the applications of each division, a file design structure along with the associated hardware equipment and recommendations for further evaluating the overall performance of the system were supplied for NAVELEX.

AD-A013 652/3GA PC$5.25/MF$2.25
American Institutes for Research Silver Spring Md
A Comparison of Officer Job Content Modules with Activity Groupings Implicit in Course Design,
Robert W. Stephenson, Harry I. Hadley, and Warren P. Davis. Aug 73, 104p
Contract DAHC19-73-C-0041
See also report dated Oct 70, AD-757 794.

Descriptors: *Personnel management, *Army personnel, Information systems, Management planning and control, Military requirements, Skills, Manpower utilization, Performance(Human), Job analysis, Management information systems, Taxonomy, Language, Decision making, Human resources, Classification.
Identifiers: Military occupational specialty, Duty modules, Task analysis.

A new, more specific language for describing work activities is being designed for the Army on an experimental basis. This language is designed for the purpose of improving communications between resource and requirement planners and program operators. Also, it will permit the integration of future data bases. The new language is based upon a concept called the duty module. Duty modules are clusters of tasks that tend to go together occupationally and organizationally in meaningful ways. They are initially identified and formulated based upon a detailed examination of task inventory or job analysis data. Then attention is given to ways in which these tentatively identified job content modules can be tested against various available criteria of operational utility.

AD-A013 670/5GA PC$7.00/MF$2.25
Hay Associates Washington D C
Navy Recruitment Potential in Junior Colleges.
Final rept. Sep 74-Jul 75,
Allan H. Fisher, Jr., Linda D. Pappas, and Sharon Shepherdson. Jul 75, 189p Rept no. TR-76-1
Contract N00014-75-C-0038

Descriptors: *Recruiting, *Naval personnel, Military recruits, All volunteer, Officer personnel, Enlisted personnel, Careers, Motivation, Sociometrics, Questionnaires, Males, Students, Universities, Demography, Recruiters, Effectiveness, Public relations, Social communication.
Identifiers: Junior colleges, Advertising.

The major objective of this survey research project was to estimate the Navy recruitment potential of male, junior college students. The results of a national survey of 807 students suggest that a promising recruitment market exists for officer and enlisted recruiting, including both the active force and the Reserve. A second objective was to determine if the enlistment potential of male, junior college students varies in terms of common demographic characteristics such as age, education, race, family income, mental ability, etc. There were very few instances of demographic variables being related to enlisted potential or officer potential. A final objective was to determine the relative preference of male, junior college students with respect to alternative recruitment strategies. This involved the evaluation of preferred alternative modes of contact, e.g., the recruiter or the various advertising media. Survey findings document the importance of the recruiter, and suggest promising media and appeals which could be employed in recruitment advertising directed to this target market segment.

AD-A013 770/3GA PC$3.25/MF$2.25
Office of Naval Research London (England)
Centralization and Vigor - French Education and Research,
Philip Stocklin. 26 Jun 75, 18p Rept no. ONRL-10-75

Descriptors: *Courses(Education), *France, Education, Schools, Industrial training, Universities, Students, Planning.

Since the mid 1950's French science and technology have developed at a phenomenal rate. French National Planning which has led to centralization of scientific education and the planning of research, is summarized as an introduction to a discussion of French education, a major factor in the development of science and technology. The organization of the Ministry of Education, together with a summary of primary, secondary and tertiary education and the 'grands etablissements' of France, is the major topic treated. The report concludes with a comparison of U.S. and French educational and research statistics.

AD-A013 848/7GA PC$4.25/MF$2.25
IBM Federal Systems Div Gaithersburg Md
Program Documentation for the Phase VI EWO Crew Station Simulation Programs,
W. E. Brandt, Jr., and D. L. Wartluft. Jan 75, 56p AMRL-TR-75-22, AMRL-HESS-75-2
Contract F33615-72-C-1378

Descriptors: *Performance(Human), *Electronic warfare, Performance tests, Flight simulators, Threats, Simulation, Training devices, Response, Data storage systems, Computer applications, Officer personnel, Flow charting, Computer programs, FORTRAN.
Identifiers: IBM 360 computers.

The Phase 6 EWO Crew Station Simulation Programs were written to provide a means for studying the performance of a trained electronic warfare officer during an electronic warfare simulation, and to analyze the impact of new equipment and the organization of old equipment on crew performance. A real-time program controls and monitors an electronic warfare simulator modified to include a set of equipment changes associated with the project. The times at which all input and output transitions occur are recorded for subsequent analysis.

AD-A013 869/3GA PC$3.25/MF$2.25
Army War Coll Carlisle Barracks Pa
Reserve Component Readiness: The FORSCOM Role.
Student essay,
Lyle C. Doerr. 4 Jan 75, 22p

Descriptors: *Military reserves, *Combat readiness, Force level, Army personnel, National guard, Resources, Military requirements, Personnel management, Mobilization, Deployment, Personnel selection, Military assistance, Personnel development, Army training.
Identifiers: Steadfast concept, FORCOM(Forces command), Forces command.

With a recognition that the increased reliance upon the Reserve components as essential elements within the Total Force Policy demands the achievement of unprecedented readiness levels, the STEADFAST reorganization of the Army was initiated in 1973 in order to provide an organizational structure within which the single clear-cut mission of readiness could be addressed. The STEADFAST concept as well as the organizational framework of FORSCOM and its application with respect to a typical National Guard organizational have been studied and interviews conducted with individuals closely associated with several aspects of the program in order to ascertain the strengths and weaknesses of the concept in practice. STEADFAST has experienced major success with relatively minor shortcomings and should require only fine tuning of the mechanism in order to best be able to respond to its mandate. (Author)

AD-A013 968/3GA PC$4.25/MF$2.25
Air Force Occupational Measurement Center Lackland AFB Tex
Television Equipment Repair Career Ladder AFSCS 30435/30455/30475/ and 30496.
Occupational survey rept.
31 Jul 75, 58p Rept no. AFPT-90-304-144

Descriptors: *Personnel development, *Television equipment, *Repair, Job analysis, Careers, Job training, Questionnaires, Air Force personnel, Attitudes(Psychology), Skills.
Identifiers: *Career ladders.

This report describes the results of an Air Force Occupational Survey of the Television Equipment Repair Career Ladder, AFSC 304X5/30496, conducted by the Occupational Survey Branch, USAF Occupational Measurement Center, from December 1973 through June 1975. The report describes the development of the survey instrument, its administration to job incumbent and resulting summaries of tasks performed by airmen grouped by skill level, experience level, and similarity of tasks performed.

AD-A013 983/2GA PC$5.75/MF$2.25
Army Logistics Center Fort Lee Va
Review of LOGEX. Main Report and Appendixes A-I.
Final rept.
May 75, 132p

Descriptors: *Army training, *Military reserves, *Logistics planning, Effectiveness, Cost analysis, Military personnel, Officer personnel, Combat readiness.
Identifiers: *Logistics management.

The objective of the study was to examine the effectiveness of, alternatives to, and potential resource savings in the current logistical exercises prepared and conducted by the Logistics Exercise Directorate of the US Army Logistics Center, Lort Lee, Virginia. The study recommends a training plan for the CPX training of Reserve Component combat support and combat service support units of Group size and larger and further recommends that a new exercise be prepared every third year as opposed to the current annual preparation. The study concludes that there are potential resource savings associated with the preparation and conduct of logistics exercises which can be realized by varying the frequency of exercise preparation, restricting participation and reducing transportation costs through the increased use of Regional exercises.

AD-A013 991/5GA PC$4.25/MF$2.25
Navy Personnel Research and Development Center San Diego Calif
Attitudinal and Demographic Characteristics of Company Commanders: A Comparative Analysis Across Recruit Training Centers.
Final rept.,
Wilfredo R. Manese, Melitta Skrobiszewski, and Norman M. Abrahams. Aug 75, 66p Rept no. NPRDC-TR-76-4

Descriptors: *Officer personnel, *Personnel management, *Recruits, Military personnel, Demography, Job satisfaction, Performance(Human), Attitudes(Psychology), Surveys.

To provide background information for an ongoing study (seeking to develop psychometric measures predictive of company commander effectiveness), a survey questionnaire was administered to company commanders at the Navy's three recruit training centers. The survey assessed the comparability of the training centers in terms of the demographic characteristics, satisfaction levels, and job-related attitudes of onboard company commanders. In addition, data from this study were compared with similar data collected in a 1957 survey.

AD-A014 020/2GA PC$3.25/MF$2.25
Naval Health Research Center San Diego Calif
Attitudes Predictive of Diving Training Success.
Final rept.,

David H. Ryman, and Robert J. Biersner. 1974, 11p Rept no. 74-59
Availability: Pub. in Personnel Psychology, v28 p181-188 1975.

Descriptors: *Naval training, *Divers, *Attitudes(Psychology), Underwater demolition teams, Volunteers, Motivation, Job training, Personnel selection, Predictions, Reprints.

The relationship of training success and attitudes were examined for Second Class Diver Training and two phases of Underwater Demolition Team training. Factor analysis of 25 attitude items indicated two common scales (Training Motivation and Leadership) and one unique scale appeared for trainees at the beginning of each course. The Training Motivation and Negative Aspects scales were found to be predictive of DSA success, whereas only Training Motivation consistently predicted UDT success. Voluntarily dropping from training was the primary reason for training failure identified by the Training Motivation scale. (Author)

AD-A014 063/2GA PC$4.75/MF$2.25
B-K Dynamics Inc Rockville Md
The NARM/Manpower-Cost Model User's Manual.
Technical rept. Sep 74-May 75,
R. Zimmerman. 14 May 75, 77p Rept no. BKD-TR-3-193
Contract N00014-75-C-0087

Descriptors: *Manpower, Mathematical models, Computer programming, Naval personnel, Cost analysis, Inventory analysis, Manuals.

The report is intended as a user's manual for those interested in the NARM's Manpower Cost Model and its calculations involving manpower inventories, variable manpower support, and variable manpower costs. A comprehensive bibliography is attached as Appendix III for those interested in features of the NARM not covered in this report.

NTIS/PS-75/675/9GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Job Analysis Methodology (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Carolyn Shonyo. Aug 75, 100p*

Descriptors: *Bibliographies, *Job analysis, Methodology, Work measurement, Upgrading, Classifications, Job satisfaction, Job development, Job redesign.

Reports on various methods of analyzing jobs are abstracted in the bibliography of Government-sponsored research. Specific topics include work measurement, factor analysis, job restructuring, job performance prediction, job classificaton, and task analysis. (Contains 95 abstracts)

NTIS/PS-75/685/8GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Audiovisual Education (A Bibliography with Abstracts).
Rept. for 1964-Jun 75,
Gerald H. Adams. Sep 75, 137p*

Descriptors: *Bibliographies, *Visual aids, *Education, Programmed instruction, Schools, Industrial training, Training films, Film slides, Motion pictures, Television equipment, Handbooks, Classifications.
Identifiers: *Audiovisual instruction, Curricula, Instructional materials.

The bibliography covers audiovisual aids, visual aids, and other supports useful for instruction and training. Instructional materials, training films, teaching techniques, training methods, programmed instruction, industrial applications, audiovisual systems, simulators, slides, motion pictures, and multimedia presentations are described. The use of television and satellite systems is included. Flight simulators, covered in a separate bibliography, are excluded. (Contains 132 abstracts)

PB-243 368/8GA PC$7.25/MF$2.25
Maryland Univ., College Park.
Studying Wage Changes with a Simulation of the Labor Market.
Final rept. 1 Oct 74-1 Apr 75,
Myles Maxfield, Jr. 1 Apr 75, 204p DLMA-91-24-75-05-1
Grant DL-91-24-75-05

Descriptors: *Labor market, *Economic models, Computerized simulation, Manpower programs, Unemployment, Bargaining, Cost effectiveness, Employment, Government policies, Information systems, Placement, Wage rates, Theses.

The report contains a micro-economic computer simulation of a job-search model of the U.S. labor market. Parameters are calibrated to reproduce time series of wages, umemployment rates, and duration of unemployment for the three years 1967 through 1969. The effects of turnover rates and unemployment rate dispersion on the Phillips curve are estimated. The effects of a cost equivalent Public Service Employment Program and a manpower training program are compared.

PB-243 802/6GA PC$3.75/MF$2.25
Baltimore City Mayor and City Council, Md.
Report on Camp Concern: A Summer Day Camp for Disadvantaged Youth of Baltimore, Maryland, June 6, 1968-August 31, 1968.
Final rept. 18 Jun-30 Sep 68.
1968, 50p HRA/OC-76/024
Contract PH-108-68-86

Descriptors: *Summer camps, *Career development, *Public health, Recruiting.
Identifiers: *Disadvantaged youth.

The report reflects the effort made at introducing health careers to the disadvantaged youth of Baltimore City at a summer day camp program held in the summer of 1968. The report discusses the methodology utilized; the camp program operations; the health subjects covered; and recommendations for future operations of camp concern.

5J. Psychology (Individual and Group Behavior)

AD-A013 582/2GA PC$6.25/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
A Model of Human Cognitive Behavior in Writing Code for Computer Programs. Volume I,
Ruven Brooks. May 75, 154p AFOSR-TR-75-1084
Contract F44620-73-C-0074, ARPA Order-2466
See also Volume 2 dated May 75, AD-A012 918.

Descriptors: *Behavior, *Programmers, Memory(Psychology), Skills, Computer programming, Perception(Psychology), Proficiency.
Identifiers: *Cognition.

A theory of human cognitive processes in writing code for computer programs is presented. It views behavior in terms of three processes, understanding, planning, and coding. The first of these consists of acquisition of information from the problem instructions and directions. This is used by the planning process to create a solution plan stated as a set of functional specifications in a language which is independent of the syntax of the particular programming language. The coding process converts this plan to code using a process named 'symbolic execution' in which pieces of code are assigned effects expressed in terms of the functions the programmer intends the code to perform in achieving the purpose of the program. Within the framework of this theory, a more explicit model of the coding process was developed. The model is based on a production system and has been implemented as a computer program. Given plans taken from protocols of a programmer writing a series of short FORTRAN programs, it is able to generate the same code in the same order as the programmer did.

AD-A013 616/8GA PC$3.75/MF$2.25
Federation of American Societies for Experimental Biology Bethesda Md
Biological Correlates of Cognitive, Sensory and Motor Abilities.
Technical rept.,
John M. Talbot. Apr 75, 33p AFOSR-TR-75-1124
Contract F44620-74-C-0077, ARPA Order-2808

Descriptors: *Senses(Physiology), *Behavior, *Learning, Reviews, Psychophysiology, Performance(Human), Brain, Central nervous system, Perception, Skin(Anatomy), Response(Biology), Stimuli.
Identifiers: *Cognition, Information processing(Psychology), *Neurophysiology, *Somatosensory cortex.

The review of somaesthesis attempts to highlight its biological correlates and to relate somatic sensory processes to behavior. Current knowledge of the somaesthetic systems is summarized and significant gaps are noted. Exciting disclosures in the anatomy, physiology, biochemistry and biophysics of somaesthetic systems are surfacing with increasing frequency as a result of modern research approaches. Progress has been rapid in the electrophysiological 'mapping' of afferent systems from the peripheral receptors into the sensorimotor cortex and in identifying in other parts of the brain and brain stem, neurons and groups of cells which respond to somaesthetic stimulation. Sensory feedback and control are under investigation, and important revelations of perceptual processes, especially in vision and hearing, are being published.

AD-A013 617/6GA PC$3.25/MF$2.25
Federation of American Societies for Experimental Biology Bethesda Md
Sensitivity of Auditory and Vestibular Systems to Stimuli Other Than Sound and Motion.
Technical interim rept.,
Kenneth D. Fisher, C. Jelleff Carr, and John M. Talbot. Apr 75, 22p AFOSR-TR-75-1125
Contract F44620-74-C-0077, ARPA Order-2808

Descriptors: *Hearing, *Vestibular apparatus, *Auditory nerve, Sensitivity, Stimuli, Reviews, Senses(Physiology), Response(Biology), Environments, Electromagnetic radiation, Ultrasonics, Infrasonics, Sound.

There is evidence to suggest that auditory and vestibular systems can be stimulated by forms of energy other than sound, gravity and motion. This report reviews the evidence related to such sensitivity and indicates the potential importance of enhanced sensory capabilities. Suggestions for future research on the response of the auditory and vestibular systems to additional environmental stimuli are presented.

AD-A013 673/9GA PC$3.25/MF$2.25
California Univ Berkeley Inst of Industrial Relations
Credibility and Communication in Work Units.
Technical rept.,
Charles A. O'Reilly, III, and Karlene H. Roberts.
Jun 75, 18p Rept no. TR-8
Contract N00014-69-A-0200-1054

Descriptors: *Interpersonal relations, *Social communication, Judgement(Psychology), Reliability, Confidence level, Information exchange, Effectiveness, Risk, Perception(Psychology), Accuracy, Jobs, Organizations, Attitudes(Psychology), Cooperation, Social psychology.
Identifiers: Credibility, Expertise, Trustworthiness.

Previous research has consistently linked notions of interpersonal trust and source credibility to communication behavior. This study used three dimensions of source credibility (safety, expertise, and dynamism) to extend the summative variable 'trust' into components relevant to communication in organizational units. The credibility dimensions were shown to be differentially related to the frequency, accuracy, and openness of communication in work units. Perceptions of the accuracy and openness of information exchange were also related to the number of others contacted and the frequency of interaction.

AD-A013 674/7GA PC$3.25/MF$2.25
California Univ Berkeley Inst of Industrial Relations
Interpersonal Communication, Personnel Ratings, and Systemic Characteristics in Organizations.
Technical rept.,
Charles A. O'Reilly, III, and Karlene H. Roberts.
Jul 75, 19p Rept no. TR-9
Contract N00014-69-A-0200-1054

Descriptors: *Interpersonal relations, *Social communication, Organization theory, Perception(Psychology), Information exchange, Effectiveness, Industrial relations, Attitudes(Psychology), Decision making, Sociometrics, Organizations, Social psychology, Job analysis, Grade structure(Personnel management), Performance(Human), Supervisors, Military personnel, Group dynamics, Jobs.

Previous research suggests that communication and performance in organizations are intertwined. This study examines the relationship of individual communication in formal organizations to both objective and perceptual assessments of performance. Results confirm the link between a number of facets of organizational communication and performance. Both the quantity and quality of information appear to be important correlates of individual performance across a variety of tasks and functions. (Author)

AD-A013 675/4GA PC$3.75/MF$2.25
California Univ Berkeley Inst of Industrial Relations
Organizations as Communication Structures: An Empirical-Theoretical Approach.
Technical rept.,
Karlene H. Roberts, and Charles A. O'Reilly, III.
Jul 75, 36p Rept no. TR-10
Contract N00014-69-A-0200-1054

Descriptors: *Social communication, *Organization theory, *Interpersonal relations, Information exchange, Networks, Sociometrics, Intercommunication systems, Group dynamics, Effectiveness, Attitudes(Psychology), Social psychology, Organizations, Roles(Behavior).
Identifiers: Authority, Expertise, Organizational communication.

A research program concerned with organizational communication is discussed. The conceptual basis used to examine communication process and structure is reported and data are provided which describe communication-content-derived aspects of organizational structure. The data suggest that viewing organizations in communication content terms may be more beneficial to understanding some other organizational processes than are some more frequently used descriptions, such as formal authority charts. Hypotheses concerning possible antecedents and consequences of different communication structural phenomena are mentioned.

AD-A013 676/2GA PC$3.75/MF$2.25
California Univ Berkeley Inst of Industrial Relations
Communication Roles in Organizations: Some Potential Antecedents and Consequences.
Technical rept.,
Karlene H. Roberts, and Charles A. O'Reilly, III.
Jul 75, 33p Rept no. TR-11
Contract N00014-69-A-0200-1054

Descriptors: *Social communication, *Organization theory, Social psychology, Interpersonal relations, Information exchange, Networks, Jobs, Sociometrics, Demography, Personality, Job satisfaction, Behavior, Perception(Psychology), Roles(Behavior), Group dynamics, Naval personnel, Performance(Human), Analysis of variance.
Identifiers: Isolates(Personnel), Participants(Personnel), Organizational communication.

This paper expands on one part of a larger research program concerned with organizational communication discussed in AD A013 675. The purpose is to examine a set of potential antecedent (demographic and personality) and consequent (perceived communication, job satisfaction, organizational commitment, and job performance) variables possibly associated with the communication roles (isolate or participant) people occupy at work. The findings indicate that communication isolates and participants are differentiable in terms of affective and behavioral responses to work. Suggestions for future research are offered.

AD-A013 677/0GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind
An Experimental Test of Three Choice Shift Hypotheses.
Technical rept.,
John Keith Murnighan, and Carl H. Castore. Apr 74, 16p Rept no. TR-13
Contract N00014-67-A-0226

Descriptors: *Decision making, *Group dynamics, Conformity, Risk, Attitudes(Psychology), Shifting, Social psychology, Theory, Judgement(Psychology), Reasoning, Logic, Uncertainty, Experimental design, Hypotheses.

The present experiment pitted three choice shift hypotheses against one another in an attempt to eliminate one or more of the hypotheses and find support for those remaining. Subjects responded three times to the twelve CDQ items, once as a pretest, and twice following presentation of homogenous sets of three arguments which advocated either a risky or a cautious position. The risk-as-value, relevant arguments, and conformity-attitude change hypotheses generated three separate predictions for the subjects' responses. Results mirrored the prediction of the relevant arguments hypothesis: New information, whether it is contained in cautious or risky arguments, caused a shift toward the type of argument presented. The risk-as-value and the conformity-attitude change hypotheses could not explain the present data. (Author)

AD-A013 976/6GA PC$3.25/MF$2.25
Washington Univ Seattle Dept of Psychology
The Effect of Situational Favorableness of Leader and Member Perceptions of Leader Behavior.
Technical rept. 1974-75,
Ilene Gochman, and Fred E. Fiedler. Apr 75, 20p Rept no. TR-75-64
Contract N00014-67-A-0103-0013

Descriptors: *Leadership, *Ratings, Behavior, Assessment, Personality, Environments, Comparison, Questionnaires, Statistical processes, Analysis of variance.
Identifiers: Self appraisals, Situational effects.

Two studies examined how situational favorableness variables mediated differences between leader and member perceptions of leader behaviors. For each group, member's ratings of their leader's behavior were subtracted from the leader's self-ratings, yielding a perceptual discrepancy score. These scores were then correlated with such situational favorableness variables as leader experience, job knowledge, and Group Atmosphere. It was found that the difference between leader and member perceptions of leader behavior decreased as the situation became more favorable for the leader. These results are discussed in terms of situational favorableness, leader control, and impression management.

AD-A014 009/5GA PC$4.25/MF$2.25
Educational Testing Service Princeton N J
An Attempt to Confirm Five Recently Identified Cognitive Factors.
Technical rept.,
Ruth B. Ekstrom, John W. French, and Harry H. Harman. Jun 75, 75p Rept nos. TR-8, ETS-PR-75-17
Contract N00014-71-C-0117

Descriptors: *Psychology, *Perception(Psychology), *Mental ability, Factor analysis, Psychological tests, Hypotheses, Reasoning, Memory(Psychology), Performance(Human), Orientation(Direction), Problem solving, Correlation techniques, Test methods.
Identifiers: Cognition, Flexibility.

This report is part of a general study of reference measures for cognitive and noncognitive factors. The main activity being reported is the development of factor-referenced or marker tests for several recently identified cognitive factors. A secondary activity involves the study of possible relationships to factors already established. Developmental activities include measures for improvement of the items in the tests, determination of reliabilities, and some clarification of these cognitive factors. Five newly identified factors are concept attainment, figural fluency, integrative processes, visual memory, and verbal closure. Established factors are figural adaptive flexibility, logical reasoning, general reasoning, number facility, spatial orientation, and speed of closure.

AD-A014 080/6GA PC$6.25/MF$2.25
Naval Health Research Center San Diego Calif
Long Term Psychological and Physical Effects of the POW Experience: A Review of the Literature.
Interim rept.,
Julius Segal. Jan 74, 34p Rept no. 74-2

Descriptors: *Prisoners of war, *Stress(Physiology), Psychology, Confinement(Psychology), Survival(Personnel), Starvation, Mental disorders, Adjustment(Psychology), Brainwashing, Literature surveys.

The problem of what psychological and physical effects can be expected to remain or to appear over time as a result of the captivity ex-

perience is addressed. A review of the existing literature is presented in order to delineate the major findings which seem to be relevant in dealing with the long-term effects to be expected among prisoners of war returned from Southeast Asia. The cumulative weight of the findings, largely gathered from existing follow-up studies of concentration camp survivors, indicated that the extraordinary stresses of incarceration are related to a heightened vulnerability to physical and psychological problems over time. The need for more comprehensive and definitive long-term follow-up studies of former U.S. prisoner populations is discussed.

JPRS-65291 PC$3.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
'SAN' Psychological Test Applicable to Investigations in Work Physiology,
V. A. Doskin, N. A. Lavrenteva, O. M. Strongina, and V. B. Sharai. 23 Jul 75, 12p
Trans. of Gigiena Truda i Professionalnye Zabolevaniya (USSR) n5 p28-32 May 75.

Descriptors: *Psychological tests, *Fatigue(Biology), Stress(Psychology), Productivity, Attitudes, Emotions, Test construction(Psychology), Translations, USSR.

The report contains a description of a new psychological method based on a self-evaluation of one's feeling of well-being, activity and mood for the investigation of the nature and dynamics of the functional state of workers.

N75-26201/4GA PC$3.25/MF$2.25
Communications Research Centre, Ottawa (Ontario). Technology and Systems Branch.
A Quantitative Approach to Interpersonal Communication.
P. E. Allard, W. C. Treurniet, R. W. Mccaughern, and J. G. Craig. Apr 75, 17p CRC-1271

Descriptors: *Communication, *Dyadics, *Human behavior, *Mathematical models, *Psychophysiology, Information flow, Teleconferencing.

For abstract, STAR 1317

N75-26654/4GA PC$3.75/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Bad Godesberg (West Germany). Abteilung Luftfahrtpsychologie.
Factor Analysis of a New Multi-Dimensional Personality Questionnaire. A Check of the Factor Model in Comparison with Similar Methods.
H. Kirsch, K. M. Goeters, and R. Ewe. 21 Jan 75, 26p DLR-FB-75-20
In German; English Summary.

Descriptors: *Factor analysis, *Flight crews, *Personality tests, *Personnel selection, Psychological tests.

For abstract, STAR 1317

PB-243 433/0GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Community Dialog Project.
TAXPKG. A Group-Computer Interactive Package for Decision Making on Income Taxation Policy.
Rept. no. 3,
William B. Rouse. May 73, 26p NSF/RA/X-73/041
Grant NSF-GI-34900

Descriptors: *Decision making, *Group dynamics, *Income taxes, Policies, Time sharing, Revenue, Data reduction, Constraints, Tax structure, Information systems, Selection, Computer programs, FORTRAN.
Identifiers: Policy making, TAXPKG computer program, Community dialog project.

This report presents a rational approach for groups to use to discuss income taxation policy. The approach is based on the assumption that a defined amount of revenue is required. The task for groups using the TAXPKG approach is to determine a taxation policy that will yield the required revenue. The group is required to a (remote) time-shared computer that has as a data base the gross income distribution of the U.S. and it is programmed to allow the group to manipulate the data in various ways. The group can choose several constraints; the computer will determine whether or not those constraints are consistent and display possible tax schedules that satisfy the constraints. The group votes to determine the level of each constraint and the computer uses either the group's mean or median vote depending on which statistic the group has chosen to use. The report includes a listing of the FORTRAN program, an explanation of the mathematics involved, and a user's manual for the package.

PB-243 480/1GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Community Dialog Project.
Utility Approach to Group Decision Making.
Rept. no. 2,
William B. Rouse, and Thomas B. Sheridan. Jul 73, 40p NSF/RA/X-73/042
Grant NSF-GI-34900

Descriptors: *Decision making, *Group dynamics, Methodology, Real time operations, Selection, Management systems, Optimization, Information systems.
Identifiers: Utility theory, Preferences, Community dialog project.

This report presents progress in an effort to develop practical analytical methods to aid groups in making decisions. Because the methods are analytical, a computer is necessary to perform calculations, simulations, and optimizations. Practicality is emphasized because the approach must be applicable to real-time use with mathematically unsophisticated groups. Specifically, the procedures developed emphasize use of utility theory and the aggregation of individual preferences into group preferences. The group preferences are then used by the computer to suggest possible decisions which the group can discuss and choose to accept or reject. If suggested decisions are rejected, the procedure is reiterated and alternative decisions proposed.

5K. Sociology

JPRS-65230 PC$7.50/MF$2.25
Joint Publications Research Service, Arlington, Va.
Sociological Studies,
A. G. Kharchev. 15 Jul 75, 240p
Trans. of Sotsiologicheskie Issledovaniia (USSR) n1 p3-223 Jan/Mar 75.

Descriptors: *Social sciences, *Behavioral sciences, Research, Communism, Sociology, Personality, Planning, Problem solving, Social psychology, Meetings, Forecasting, USSR, Translations.

The report contains articles on sociological studies, developments and problems within the USSR and as they relate to communist and other countries.

NTIS/PS-75/682/5GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Population Projections for Small Areas (A Bibliography with Abstracts).
Rept. for 1968-Jul 75,
Mary E. Young. Sep 75, 100p*

Descriptors: *Population projections, *Bibliographies, Population trends, Housing market, Demography, Population forecasting, Employment, Regional planning, Economic projections, Urban planning, Land use, Transportation.

Reports on predictions of population growth or change in state, regional, county, or municipal areas are abstracted in the bibliography. Included are reports on projections for area economic analysis, employment, land and resource use, education, energy, and transportation needs and planning. (Contains 95 abstracts)

PB-243 263/1GA PC$3.25/MF$2.25
Virginia Dept. of Welfare and Institutions, Richmond.
National Service Reform Project As a Part of Virginia's Total Design of the Social Service System. Section 11/5.
Final rept,
30 Nov 73, 8p SRS-11-57298-001
Grant SRS-11-57298

Descriptors: *Social welfare, *Services, Public assistance, Systems engineering, Effectiveness, Pilot projects, Objectives, Community cooperation, Virginia.

Two regions in Virginia were chosen to evaluate the Community Services Administration's Social Service System Design as part of the National Service Reform Project. This brief final report summarizes the major components of the system, which was designed to improve efficiency and effectiveness of services to welfare recipients, as well as to provide a capability for evaluation of its function in the future. Both communities found the design applicable to their needs, and statewide implementation was anticipated.

PB-243 266/4GA PC$5.75/MF$2.25
Japanese Community Pioneer Center, Los Angeles, Calif.
Japanese American Sightless Institute Project.
Final rept.,
Karen Chomor, Carol Hatanaka, and Cathy Higashioka. Jun 74, 142p SRS-08-55949-001
Grant SRS-08-55949

Descriptors: *Social welfare, *Blindness, Ethnic groups, Services, Handicapped persons, Socially disadvantaged minorities, Vocational guidance, Ethnopsychology, California.
Identifiers: *Japanese Americans.

The project addressed itself to service barriers in an ethnic minority community: (1) the incongruences of service delivery systems and (2) the marginal status of handicapped consumers. Also that formation and utilization of ethnic self-help models would be a viable methodology for servicing ethnic minority communities, and that intermediate use of an ethnically homogeneous group in service delivery would heighten consumer receptivity and enhance consumer identification were explored. The project created a model for service agencies to develop in reaching minority consumers.

PB-243 631/9GA PC$3.75/MF$2.25
California Univ., Los Angeles. School of Architecture and Urban Planning.

Lifestyles and Transportation Needs Among the Elderly of Los Angeles County,
Jacqueline Gillan, and Martin Wachs. Feb 75, 28p UMTA-CA-11-0009-75-1

Descriptors: *Travel demand, *Senior citizens, Old age, Requirements, Mobility, Transportation, California, Surveys.
Identifiers: *Elderly persons, Los Angeles County(California).

The report examined the trip-making behavior of persons over 65 years of age residing in Los Angeles County, California. The two types of elderly lifestyles that were studied were those living in the inner-city and those located around the urban fringe. Four areas within the county were selected that reflect these two living patterns. A comparative analysis of trip patterns and socio-economic data was completed. In addition to investigating travel patterns, a survey of taxicab use on weekends and weekdays was undertaken. The elderly represent a substantial proportion of taxicab patrons. Their use of taxis is further indicative of the changes which occur in mobility patterns upon reaching retirement. This mode of transportation is presently the only type of demand-responsive service available to the senior population in some parts of the county. Tables present data collected in the study.

PB-243 817/4GA PC$4.75/MF$2.25
Commission on the Review of the National Policy Toward Gambling, Washington, D.C.
Moral Views on Gambling Promulgated by Major American Religious Bodies.
Final rept.,
Raymond C. Bell. Oct 74, 93p* NGC-75/01

Descriptors: *Ethics, *Religions, Attitudes, Public opinion, Revenue, Risk.
Identifiers: *Gambling.

A study of the attitudes of major religious groups in the United States--as revealed in official church statements and in responses by religious leaders to a questionnaire--was prepared for the National Gambling Commission. The history of each group's ethical position toward gambling, as well as its current thinking on the subject, was surveyed. Analysis of the findings revealed considerable variation in the extent and intensity of gambling attitudes among the churches. National and State councils of churches were also queried on the subject.

PB-243 818/2GA PC$3.75/MF$2.25
Commission on the Review of the National Policy Toward Gambling, Washington, D.C.
Gambling-Related Corruption.
Final rept.,
Carol H. Duncan. Sep 74, 38p* NGC-75/03

Descriptors: *Ethics, *Police, Law enforcement, Criminal investigations, Attitudes, Organized crime.
Identifiers: *Gambling.

A selective survey of state and local crime commission reports and corruption literature reveals that although gambling-related corruption affects all parts of the criminal justice system and all three branches of government, police have been the primary subject of study and investigation. Examples of corruption involving gambling are given; the legal, political, public, and organizational contexts in which such corruption occurs are discussed; and corruption-control measures proposed by various experts are reviewed.

PB-243 819/0GA PC$3.75/MF$2.25
Commission on the Review of the National Policy Toward Gambling, Washington, Washington, D.C.
Gambling Enforcement and Police Corruption.
Final rept.,
Jonathan Rubinstein. Oct 74, 37p* NGC-75/02

Descriptors: *Ethics, *Police, Law enforcement, Criminal investigations, Attitudes, Public opinion, Risk.
Identifiers: *Gambling.

The research paper was prepared for the National Gambling Commission. The author, drawing from the reports of the Pennsylvania Crime Commission and the Knapp Commission in New York City, among others, discusses the role of the police in the enforcement of local gambling laws. He lists a number of questions concerning gambling and police corruption that he says have not been answered or even raised by those who should be concerned with the problem. He traces the career of a patrolman from his early, insufficient training through his probable corruption by his colleagues or local gambling operators. According to the author, corruption usually exists at all levels of law enforcement and often is supported by other, higher levels of government.

PB-243 820/8GA PC$5.25/MF$2.25
Commission on the Review of the National Policy Toward Gambling, Washington, D.C.
Gambling in Perspective: A Review of the Written History of Gambling and an Assessment of its Effect on Modern American Society.
Final rept.,
Oct 74, 105p* NGC-75/04
Prepared in cooperation with Fact Research, Inc., Washington, D.C.

Descriptors: *Ethics, *Organized crime, History, Organization, Attitudes, Public opinion, Law enforcement, Risk.
Identifiers: *Gambling.

The report is based on a selective search of gambling literature, drawn from some 2,000 books in a collection at the University of Nevada, Las Vegas. As such, it contains no conclusions except those of the authors of those books, and the only assessments it attempts are limited to the literature. The purpose of the report is to establish a point of departure for further research into the complex subject of gambling, on the theory than an essential element of successful study is an awareness of how little is really known.

PB-243 821/6GA PC$4.25/MF$2.25
Commission on the Review of the National Policy Toward Gambling, Washington, D.C.
Social Aspects of Gambling.
Final rept.,
Kathleen M. Joyce. 1974, 54p* NGC-75/05

Descriptors: *Ethics, *Public opinion, Attitudes, Law enforcement, Human behavior, Surveys, Revenue, Risk.
Identifiers: *Gambling.

The discussion of gambling research is broken into three sections. The first deals with available public opinion data bearing generally on gambling attitudes, specific lottery attitudes, and gambling issues of concern to the public. The second section outlines some of the social aspects of gambling and discusses research that is qualitative in nature. The purpose of this section is to describe some of the social settings in which the gambler moves and some of the institutional qualities of gambling operations and societal responses to gambling. The third section discusses the scant body of available participation rates for different types of gambling in the United States.

PB-243 850/5GA PC$6.50/MF$6.50
Urban Inst., Washington, D.C.

Employing Civilians for Police Work,
Alfred I. Schwartz, Alease M. Vaughn, John D. Waller, and Joseph S. Wholey. May 75, 90p* URI-11700

Descriptors: *Police, *Paraprofessional personnel, Government employees, Local government, Recruiting, Fringe benefits, Specialized training, Surveys.

A growing number of police departments employ civilians in jobs traditionally filled by uniformed officers. A majority of the departments in the United States, however have not decided whether this is a useful approach. The authors surveyed 80 cities across the nation to determine the predominant uses of civilians by police departments. Then they further studied 13 cities that appeared typical in this respect and that also represent a range of sizes and geographic locations. Major functions carried out by civilian police employees include communications work, such as takin public calls and transmitting information received to police officers; crime detection specialities, such as fingerprinting and photography; and serving as jailer in detention facilities. A more recent civilian role, often called a Community Service Officer or CSO, involves young men and women as cadets or trainees in a wide variety of police activities (traffic control and taking reports, for instance). CSOs operate without weapons or special arrest powers. The authors assess the benefits of these programs employing civilians, discuss problems associated with them, and cite factors that can lead to their successful use.

PB-244 099/8GA PC$4.25/MF$2.25
Naval Ammunition Depot, Crane, Ind.
Vandalism Suppression by Helicopter.
Final rept.,
Charles E. Aylworth. Jan 73, 74p FRA-OPP-74-1
Contract DOT-AR-20013

Descriptors: *Vandalism, *Crime reduction, *Railroad terminals, Helicopters, Police patrols, Security systems, Air surveillance, Law enforcement, Freight terminals, Urban transportation.

The research project is a preliminary exploration into procedures, applications and effects of helicopter surveillance of commuter and freight railroad facilities in an urban environment. The project was conducted in the Philadelphia Metropolitan Area in the Spring and Summer of 1972 for the Federal Railroad Administration and with the cooperation of the Penn Central Transportation Company and the Reading Railroad. An attempt was made to document effects of the helicopter patrol and to provide insight into the requirements of a more exhaustive program to attain statistical validation of observed impact of helicopter use.

6. BIOLOGICAL AND MEDICAL SCIENCES

6A. Biochemistry

AD-A013 576/4GA PC$3.25/MF$2.25
North Carolina Univ Chapel Hill Biochemistry Lab
Biochemical Investigations of the Host-Parasite Relationship of Mosquitos and the Parasite Fungus 'Lagenidium sp.'.
Annual summary rept. no. 1, Jul 73-1 Jul 74,
A. J. Domnas. 1 Jul 74, 6p
Contract DADA17-72-C-2168

Descriptors: *Trehalose, *Fungi, *Culex, *Enzymes, Culicidae, Parasites, Hosts(Biology), Aedes, Amino acids, Sugars, Biochemistry.
Identifiers: Culex quinquefasciatus, Lagenidium giganteum, *Host parasite relations, Proteinases, Biological insect control.

A comparative investigation of the nature of the trehalase of Culex quinquefasciatus pipiens and the trehalase of its fungal parasite Lagenidium giganteum shows some very important control differences. The mosquito enzyme is under regulatory control; in contrast, the mycotic enzyme is not, and is a more rugged enzyme seemingly constructed for more advantageous utilization of trehalose. The implications in parasitology and biological control are discussed. Further work has been done on the analysis of the amino acids and sugars in Culex as well as Aedes - both normal and infected populations. The fungus has been shown to produce a strong extra-cellular protease whose partial characterization shows that it is an alkaline enzyme, serine catalyzed, approximately 10,000 daltons molecular weight and is probably involved in infection by the zoospore.

AD-A013 703/4GA PC$3.25/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
Biochemical and Immunological Properties of Ribonucleic Acid-Rich Extracts from Francisella tularensis,
Leo A. Andron, II, and Henry T. Eigelsbach. 24 Mar 75, 6p
Availability: Pub. in Infection and Immunity, v12 n1 p137-142 Jul 75.

Descriptors: *Ribonucleic acids, Immunoassay, Biochemistry, Lethal agents, Lethal dosage, Bacteria, Tularemia, Reprints.
Identifiers: *Francisella tularensis, *LVS Francisella tularensis.

Ribonucleic acid (RNA)-rich extracts derived from the attenuated strain of Francisella tularensis (strain LVS) protected Swiss mice against lethal challenge with F. tularensis strain 425 but not against strain SCHU S4. No killed preparation, including an RNA-rich extract from SCHU S4 itself, offered protection against strain SCHU S4 in contrast to the high level of protection offered against this strain by vaccination with live strain LVS. The protective activity observed against strain 425 was sensitive to ribonuclease but not to Pronase. Protective activity is not a general property of bacterial RNA, since RNA-rich extracts from Staphylococcus aureus offered no protection against tularemia, although disc gel electrophoresis showed similar kinds and amounts of RNA in preparations from F. tularensis and S. aureus. Furthermore, inability to localize activity to a specific region in sucrose gradients suggests a structural rather than an informational role for the RNA in such extracts. RNA-rich extracts from F. tularensis but not from S. aureus were efficient inducers of F. tularensis opsonins in mouse serum, suggesting one mechanism by which such extracts confer protection. (Author)

AD-A013 900/6GA PC$3.25/MF$2.25
Texas Univ Health Science Center San Antonio Dept of Pharmacology
Estimation of Choline and Acetylcholine in Tissue by Pyrolysis Gas Chromatography.
William B. Stavinoha, and Susan T. Weintraub. 7 Sep 73, 5p AFOSR-TR-75-1220
Grants AF-AFOSR-2074-71, PHS-NS-09356-02
Availability: Pub. in Analytical Chemistry, v46 n6 p757-760 May 74.

Descriptors: *Cholines, *Acetylcholine, Quantitative analysis, Gas chromatography, Pyrolysis, Tissues(Biology), Reprints.

The purpose of this paper is to present a method for the measurement of choline and acetylcholine by pyrolysis gas chromatography which is both more rapid and facile that previously described procedures and yet does not compromise in sensitivity or reliability. (Author)

N75-26023/2GA PC$5.75/MF$2.25
Technische Universitaet, Munich (West Germany).
On the Influence of Organic Solvents on the Activity and Stability of Proteases Zum Einfluss Organischer Loesungsmittel Auf die Aktivitaet und Stabilitaet von Proteasen.
Ph.D. Thesis.
F. Thurner. 4 Jul 74, 128p
Language in German.

Descriptors: *Molecular structure, *Organic liquids, *Protease, *Stabilizers (Agents), Biochemistry, Catabolism, Enzyme activity, Reaction kinetics, Solvents.

For abstract, STAR 1317

N75-26061/2GA PC$11.50/MF$2.25
Battelle Columbus Labs., Ohio.
Sample Detection and Analysis Techniques for Electrophoretic Separation.
Final Report.
R. D. Falb, K. E. Hughes, and T. R. Powell. 12 Jun 75, 465p NASA-CR-143877
Contract NAS8-29629

Descriptors: *Biochemistry, *Electrophoresis, *Space laboratories, Cells (Biology), Chemical analysis, Photography, Photometry, Ultrasonic tests.

For abstract, STAR 1317

6B. Bioengineering

N75-26339/2GA PC$4.75/MF$2.25
Institute of Research and Instrumentation, Houston, Tex.
Long Term Flight Electrodes.
B. Mosier. 1975, 92p NASA-CR-141876
Contract NAS9-2762

Descriptors: *Biomedical data, *Electrodes, *Electrophysiology, *Flight stress (Biology), Aerospace medicine, Body measurement (Biology), Colloids, Human factors engineering, Medical electronics, Plants (Botany).

For abstract, STAR 1317

6C. Biology

AD-A013 698/6GA PC$3.25/MF$2.25
Naval Medical Research Unit No 3 Fpo New York 09527
Haemaphysalis Verticalis Itagaki, Noda, and Yamaguchi: Rediscovery in China, Adult and Immature Identity, Rodent Hosts, Distribution and Medical Relationships (Ixodoidea: Ixodidae).
Technical scientific rept.,
Nadezhda D. Emel'yanova, and Harry Hoogstraal. 19 Jan 73, 14p Rept no. NAMRU-3-TR-52-74
Availability: Pub. in Jnl. of Parasitology, v59 n4 p724-733 Aug 73.

Descriptors: *Parasites, Disease vectors, Distribution, Rodents, Hosts(Biology), Ticks, China, Reprints.
Identifiers: *Ixodoidea, *Ixodoidae, *Ixodidae.

Haemaphysalis verticalis Itagaki, Noda, and Yamaguchi was described in 1944 from two females parasitizing a domestic dog in Shansi, China. Except for a recent note by the first author of the present paper, this taxon has otherwise not been mentioned in literature. We redescribe the female and describe the male, nymph, and larva from specimens taken in southeastern China, mostly from susliks (ground squirrels), Citellus dauricus ramosus Thomas, and fewer from the long-clawed jird, Meriones unguiculatus subsp. The subgeneric position of this unusual tick species is uncertain. The adults are remarkable in this genus for having a 3/3 dental formula and for remaining in burrows to parasitize rodents, an unusual haemaphysalid life pattern that may be important in maintaining circulation of infectious agents in a rodent population. Haemaphysalis ticks reported by workers in northeastern China to have been infected by the agent of plague are likely to have been H. verticalis, and the suslik is considered to be the chief reservoir of plague in this area. (Author)

AD-A013 699/4GA PC$3.25/MF$2.25
Naval Medical Research Unit No 3 Fpo New York 09527
Haemaphysalis (Kaiseriana) Mageshimaensis Sp.N. (Ixodoidea: Ixodidae), A Japanese Deer Parasite with Bisexual and Parthenogenetic Reproduction.
Technical scientific rept.,
Yutaka Saito, and Harry Hoogstraal. 19 Jan 73, 14p Rept no. NAMRU-3-TR-56-74
Availability: Pub. in Jnl. of Parasitology, v59 n3 p569-578 Jun 73.

Descriptors: *Parasites, Reproduction, Ticks, Japan, Deer, Disease vectors, Life cycles, Reprints.
Identifiers: *Ixodoidea, *Ixodoidae, *Ixodidae, *Mage Island(Japan).

Haemaphysalis (Kaiseriana) mageshimaensis sp.n., a member of the H. (K.) bispinosa group, is described from males, females, nymphs, and larvae from pasture vegetation (and laboratory-reared) from Mage Island in Kagoshima Prefecture, Japan. The sika deer, which is common on Mage Island, appears to be the original host. Most of the cattle on the island are infected by Theileria sp., which is probably transmitted by this tick. In the laboratory, the life cycle is completed in 93 to 108 days. Normal bisexual reproduction, with 1,000 to 1,500 eggs per female, almost 100 per cent larval hatching, and approximately equal numbers of F1-F3 males and females, was observed, as well as an appreciable though limited degree of true parthenogenetic reproduction, with few eggs, low larval hatching rate, absence of mating, and only female f1 adults. No males of this species mated with bisexual or parthenogenetic females of H. (K.) longicornis Neumann. Male longicornis mated with female mageshimaensis, but four or five days after mating almost all sperm had disappeared from female organs, the larval hatching rate was low, and all progeny consisted of mageshimaensis females.

AD-A013 749/7GA PC$3.25/MF$2.25
University of Southern California Los Angeles Dept of Biological Sciences
Nonlinear Dynamic Transfer Characteristics of Cells in the Peripheral Visual Pathway of Flies. Part I. The Retinula Cells,
Hendrik Eckert, and Lewis G. Bishop. 3 Feb 74, 8p AFOSR-TR-75-1139-Pt-1
Grants AF-AFOSR-2112-71, NSF-GB-30733
Prepared in cooperation with California Institute of Technology, Grants PHS-NS-0327 and PHS-GM-15537. Errata sheet inserted.
Availability: Pub. in Biological Cybernetics, 17 p1-6 1975.

Descriptors: *Cells(Biology), *Retina, White noise, Diptera, Eye, Transfer, Depolarization, Modulation, Stimulation(Physiology), Response(Biology), Reprints.
Identifiers: Flies.

White noise modulated stimuli were employed for studying the transfer characteristics of the intra cellularly measured retinula cell respon-

ses of the chalky mutant of the blowfly Calliphora erythrocephala Meig. Average depolarization levels varied between 6 and 20 mV. Response modulation depths of up to + or - 44% could be achieved. The analysis of the stimulus-response relationship, which takes into account nonlinear properties of the receptor cell response, reveals that this system is essentially linear for an intermediate frequency range between approximately 5 and 30 Hz. For higher as well as lower frequencies the system becomes increasingly nonlinear. (Author)

AD-A013 750/5GA PC$3.25/MF$2.25
University of Southern California Los Angeles Dept of Biological Sciences
An Ultraviolet Photoreceptor in a Dipteran Compound Eye,
Lewis G. Bishop. 16 Jan 74, 10p AFOSR-TR-75-1141
Grants AF-AFOSR-2112-71, NSF-GB-30733
Availability: Pub. in Jnl. Comparative Physiology, v91 p267-275 1974.

Descriptors: *Cells(Biology), *Retina, Diptera, Reception, Monochromatic light, Eye, Colors, Vision, Response(Biology), Ultraviolet radiation, Reprints.
Identifiers: Flies.

Intracellular recordings of the retinula cell receptor potential to flashes of monochromatic light demonstrate the presence of ultraviolet photoreceptors in the retina of the honeybee-mimic dronefly (Diptera, Syrphidae, Eristalis). Photoreceptors for visible light were also found. Hence, the dronefly has the neural capability for color vision. This is consistent with behavioral studies. Color vision would aid this animal in its natural habit of forraging with the honeybee. (Author)

AD-A013 751/3GA PC$3.25/MF$2.25
University of Southern California Los Angeles Dept of Biological Sciences
Intracellular Recording and Staining of Directionally Selective Motion Detecting Neurons in Fly Optic Lobe,
David R. Dvorak, Lewis G. Bishop, and Hendrik E. Eckert. 25 Jun 74, 6p AFOSR-TR-75-1140
Grants AF-AFOSR-2112-71, NSF-GR-30733
Availability: Pub. in Vision Research, v15 p451-453 1975.

Descriptors: *Cells(Biology), *Retina, Diptera, Motion, Orientation(Direction), Dyes, Injection, Response(Biology), Perception(Psychology), Reprints.
Identifiers: Flies.

The investigators have recorded intracellularly from the directionally selective motion unit in flies and have stained ten of them well by iontophoretic injection of the fluorescent dye procion yellow M4RS. Hence, they have demonstrated that recordings from identified cells is possible even though the diameters of the cells involved are as small as three micrometers. (Author)

AD-A013 820/6GA PC$3.25/MF$2.25
Human Engineering Lab Aberdeen Proving Ground Md
A Procedure for Neonatal Pinealectomy.
Final rept.,
Gerald A. Hudgens, and Neil W. Hettler. Jul 75, 9p Rept no. HEL-TM-17-75

Descriptors: *Pineal gland, *Surgical techniques, *Rats, *Birth, Behavior, Endocrinology, Stress(Physiology), Physiology.

A detailed description of procedures for performing pinealectomies on one-day-old rat pups is presented. The procedures have proved to be simple, rapid, and economical in terms of subject survival. The procedure has application in studies of the relationships between pineal function and either behavior or the functioning of other biological systems (i.e., any of the several endocrine systems). (Author)

COM-75-10996/7GA PC$3.25
Oregon State Univ., Corvallis. Dept. of General Science.
Neoplastic Disease of Yaquina Bay Bivalve Mollusks,
Michael C. Mix. 1975, 21p ORESU-R-75-003 NOAA-75062406
Grant NOAA-04-3-158-4
Pub. in Proceedings of the Annual Hanford Biology Symposium (13th), v1 p369-386 1975.

Descriptors: *Neoplasms, *Mollusca, *Animal diseases, Shellfish, Aquatic animals, Leukemias, Cytology, Histology, Pathology.
Identifiers: Oncology, Sea Grant program, Reprints.

A disease with several serious implications and ramifications, the so-called neoplastic disease of Yaquina Bay bivalve mollusks has been found in several species of economically important shellfish in Yaquina Bay, Oregon. It is a cellular proliferative disorder that superficially resembles mammalian leukemia. This paper reviews the history of the disease, its cytomorphological and histopathological characteristics, molluscan oncology, and cell renewal and describes current research on the neoplastic disease of bivalve mollusks.

COM-75-11049/4GA PC$5.25/MF$2.25
Inter-American Tropical Tuna Commission, La Jolla, Calif.
Application of Satellite Data to Problems in Fishery Oceanography.
Final rept.,
Merritt R. Stevenson, and Forrest R. Miller. May 75, 108p NOAA-75070803
Grant NOAA-04-4-158-28

Descriptors: *Fisheries, *Oceanographic data, *Remote sensing, Data processing, Marine biology, Fish harvesting, Ocean surveillance, Fish stocks, Meteorological data, Surface temperature, North Atlantic Ocean, Marine meteorology, Moisture, Fishing grounds, Meteorological satellites, California Gulf.
Identifiers: NOAA satellites, ERTS satellites.

The report describes results on methods of data processing and on the feasibility of using VHRR data to obtain SST's for an oceanic region off northwest Africa and in the Gulf of California. A comparison of VHRRIR and SRIR (GOSSTCOMP) data from several passes over the ocean off northwest Africa suggests that it is possible to calibrate VHRRIR data on the average to within about 1 degree C of ground truth, compared to about 1-2.5 degrees C for the GOSSTCOMP data. For the Gulf of California region, the VHRRIR and the GOSSTCOMP data were within about 2.5 degrees C of ground truth measured from a research vessel working in the area. Meteorological conditions in both study areas are discussed using vertical profiles of moisture, mixing ratio, etc. Also discussed is the manner in which the changing meteorological conditions affect integrated moisture values in the overlying marine layer. The feasibility of using remotely sensed data from NOAA and ERTS satellites in an integrated data system is briefly described.

COM-75-11050/2GA PC$5.75/MF$2.25
Alaska Dept. of Fish and Game, Juneau.
Alevin Abundance - Pink Salmon Prediction Studies.
Completion rept. 1 Jul 71-30 Jun 74,
Alan P. Kingsbury. Jun 75, 135p NOAA-75071103

Descriptors: *Salmon, *Animal migrations, Sampling, Predictions, Fish stocks, Abundance, Evasion, Reproduction(Biology), Aerial photographs, Remote sensing, Mapping, Intertidal zone, Southeast Region(Alaska), Forecasting.
Identifiers: Pink salmon, Alevin.

Pink salmon forecast and optimum escapement investigations continued during the contract period. Forecasts of the 1972, 1973, and 1974 Southeastern Alaska pink salmon runs were prepared based mainly on hydraulic sampling of pre-emergent fry abundance and analysis of fry-return relationships. The forecasts did not clearly indicate the decline of the runs that occurred, although three of the six unit forecasts were sufficiently accurate to aid in fishery management. Optimum pink salmon escapement was estimated from measurements of potential spawning area in streams.

COM-75-50185-03/GA PC-GPO/MF$2.25-NTIS
National Marine Fisheries Service, Seattle, Wash.
Marine Fisheries Review. Volume 37, Number 3, March 1975.
Monthly pub.,
Willis L. Hobart. Mar 75, 57p NOAA-75042901
Paper copy available from GPO as C55.310:37/3.

Descriptors: *Marine fisheries, *Fisheries research, Tunas, North Atlantic Ocean, Marine fishes, Reefs, Tires, Bass, Estuaries, Fishing grounds, Oysters, Prices, Fishing, Prince Edward Island, Cooperatives, Fish industry, Technical reports.
Identifiers: Artificial reefs, Oyster industry.

The issue contains the following articles: The Purse-Seine Fishery for Bluefin Tuna in the Northwestern Atlantic Ocean; An assessment of the South Pacific Albacore, Thunnus alalunga, fishery, 1953-72; Experiments on some possible effects of tire reefs on Pinfish (Logodon rhomboides) and Black Sea Bass (Centropristis striata); Development of a program to rehabilitate the oyster industry of Prince Edward Island; An analysis of prices paid to fishermen before and after the establishment of a fishery cooperative.

COM-75-50185-03-01/GA (Order as COM-75-50185-03)
National Marine Fisheries Service, La Jolla, Calif. Southwest Fisheries Center.
The Purse-Seine Fishery for Bluefin Tuna in the Northwestern Atlantic Ocean,
Gary T. Sakagawa. Mar 75, 9p MFR-Paper-1126 NOAA-75042901-1
Included in Marine Fisheries Review, v37 n3 p1-8 Mar 75.

Descriptors: *Tunas, *Fisheries, *North Atlantic Ocean, Fish harvesting, Marking, Fishing grounds, Abundance, Fish stocks, Cape Cod Bay, Coasts, New Jersey, New York.
Identifiers: *Thunnus thynnus.

The history of the purse-seine fishery for bluefin tuna in the northwestern Atlantic Ocean is reviewed, and events that contributed to fluctuation of the catch are discussed. The fishery began in 1958 and produced 5,770 mt (metric tons) at its peak in 1963. The catch declines from 4,290 mt in 1970 to about 1,780 mt in 1973. The 1973 catch was landed by a fleet with about 4,900 mt carrying capacity, which was in excess of the catch. Average length of bluefin tuna in the purse-seine catch decreased from about 140 cm in 1960 to about 89 cm in 1973, owing in part to a southward expansion of the fishing grounds into areas where small bluefin tuna are more available. Prior to 1962, the fishing grounds were centered in Cape Cod Bay. Currently it is centered off New Jersey-New York.

COM-75-50185-03-02/GA
(Order as COM-75-50185-03)
National Marine Fisheries Service, Honolulu, Hawaii. Southwest Fisheries Center.
An Assessment of the South Pacific Albacore, 'Thunnus alalunga', Fishery, 1953-72,
Robert A. Skillman. Mar 75, 10p MFR-Paper-1127 NOAA-75042901-2
Included in Marine Fisheries Review, v37 n3 p9-17 Mar 75.

Descriptors: *Marine fishes, *South Pacific Ocean, Abundance, Fishing, Estimating, Fish harvesting, Assessments, Mathematical models, Fish economics, Commercial fishing.
Identifiers: *Thunnus alalunga.

As the amount of fishing effort expended in the South Pacific albacore, Thunnus alalunga (Bonnaterre), fishery increased markedly from the mid-1960's through the early 1970's, measures of apparent abundance of albacore declined by more than 60%. Preliminary estimates of catch per unit effort for the first half of 1974 set new records, alarmingly low ones. Because of these factors and because of proposed further increases in harvesting pressure, an assessment of the fishery is needed. The albacore resource is assessed by using the generalized production model of Pella and Tomlinson.

COM-75-50185-03-04/GA
(Order as COM-75-50185-03)
National Marine Fisheries Service, Highlands, N.J. Sandy Hook Lab.
Development of a Program to Rehabilitate the Oyster Industry of Prince Edward Island,
Clyde L. MacKenzie, Jr. Mar 75, 17p MFR-Paper-1129 NOAA-75042901-4
Included in Marine Fisheries Review, v37 n3 p21-35 Mar 75.

Descriptors: *Oysters, *Fish industry, *Prince Edward Island, Rehabilitation, Merchant ships, Fish stocks, Shellfish, Fishing grounds, Animal ecology, Canada, Survival, Reproduction(Biology), Deep water, Growth.
Identifiers: *Crassostrea virginica.

The author developed and implemented an oyster industry rehabilitation program for Prince Edward Island in which large vessels are to transplant oysters from unharvested stocks and shells from buried deposits and spread them over otherwise barren public grounds. Great biological and ecological potentials exists for increasing oyster production because of: (1) regular annual spat-fall (reproduction), (2) high survival rates of oysters, (3) adequate growth rates, (4) existence of more than 200,000 boxes of unharvested stocks of small oysters in either deep water or on poor grounds as well as several million bushels of oyster shells, and (5) availability of at least 1,000 acres of otherwise barren public grounds possessing ecological features that produce high-quality oysters. After a few years, oyster production should more than double.

COM-75-50185-03-05/GA
(Order as COM-75-50185-03)
Texas A and M Univ., College Station. Dept. of Marketing.
An Analysis of Prices Paid to Fishermen Before and After the Establishment of a Fishery Cooperative,
Charles W. Lamb, Jr. Mar 75, 4p NOAA-75042901-5, MFR-Paper-1130
Grant NOAA-2-35364
Included in Marine Fisheries Review, v37 n3 p36-38 Mar 75.

Descriptors: *Fish industry, *Cooperatives, Objectives, Fish harvesting, Prices, Fish economics, Food storage, Food processing, Exports, Marketing.
Identifiers: Sea Grant program.

'A fishery cooperative consists of a group of individual fishermen acting together for mutual benefit and is designed to accomplish group objectives.' These group objectives are primarily economic in nature and often directly related to the prices paid to the fishermen for their catch. Common motivations to create fishery cooperatives include excessive price fluctuations, weakness of prices at the primary producer level, and/or insufficient storage and processing facilities. The paper reports the findings of a case study which compared the prices received by fishermen prior to and after the establishment of a unique fishery cooperative organization.

COM-75-50185-05-06/GA
PC-GPO/MF$2.25-NTIS
National Marine Fisheries Service, Seattle, Wash.
Marine Fisheries Review. Volume 37, Numbers 5 and 6, May-June 1975.
Monthly pub.,
Willis L. Hobart. Jun 75, 78p NOAA-75071001
Paper copy available from GPO as C55.310:37/5-6.

Descriptors: *Marine fisheries, *Fisheries research, Fish diseases, Crustacea, Cytology, Bacterial diseases, Fungus diseases, Shellfish, Spores, Meetings, Crabs, Shrimps, Pathology, Immunology, Reviews.

The issue of 'Marine Fisheries Review' contains ten articles on diseases of crustaceans. Topics covered include cytology, immunology, bacterial diseases, fungal diseases, and microsporidian infections of crustacea. Also included is an introductory article by the editor. These papers were presented at the American Institute of Biological Sciences meeting at the University of Massachusetts, Amherst, June 18-19 1975.

COM-75-50185-05-06-01/GA
(Order as COM-75-50185-05-06)
Washington Cooperative Fishery Unit, Seattle.
Introductory Remarks on Diseases of Crustaceans,
Gilbert B. Pauley. Jun 75, 3p NOAA-75071001-1, MFR-Paper-1139
Included in Marine Fisheries Review, v37 n5-6 p2-3 May-Jun 75.

Descriptors: *Crustacea, *Fish diseases, Crabs, Lobsters, Shrimps, Crayfishes, Natural resources, Disease vectors, Shellfish, Mortality, Pathology, Aquaculture, Environmental impacts, Stress(Physiology).

Cultivation of several crustaceans (crabs, lobsters, shrimp, and crayfish) is carried out commercially and for sustaining natural resources. An understanding of crustacean pathogens, natural defenses of the animals against diseases, and the methods of treating and preventing diseases will lead to more efficient and effective husbandry and ultimately better management of these resources. For infectious diseases to occur, a potential pathogen must exist, a suitable host must be present, and the proper environmental conditions must pervade that will cause either an increased virulence of the pathogen or an increased susceptibility of the host. Infectious diseases are found in both cultured crustaceans and those in the natural environmental. At least four are serious diseases that occur in economically important crustaceans. Various noninfectious diseases may also be important considerations in any crustacean aquaculture system.

COM-75-50185-05-06-02/GA
(Order as COM-75-50185-05-06)
National Marine Fisheries Service, Galveston, Tex. Gulf Coastal Fisheries Center.
Cellular Response to Injury in Penaeid Shrimp,
C. T. Fontaine, and D. V. Lightner. Jun 75, 8p MFR-Paper-1140, Contrib-374 NOAA-75071001-2
Included in Marine Fisheries Review, v37 n5-6 p4-10 May-Jun 75.

Descriptors: *Shrimps, *Injuries, Cytology, Marine biology, Wounds, Phagocytes, Fish diseases, Encapsulating, Aquatic biology.
Identifiers: Penaeid shrimp, Penaeus.

A review of the cellular response to injury in marine shrimp of the genus penaeus is presented. Studies on the inflammatory response of penaeid shrimp have shown six cell forms that respond to injury. These include three forms of hemocytes, fibrocytes, phagocytic cells of the loose connective tissues, and fixed phagocytes lining blood sinuses. The cellular defense mechanism is dependent upon the activity of the hemocytes. One type of hemocyte apparently engages in encapsulating foreign material while the other two types phagocytize and eliminate foreign or necrotic material by migrating to the external surface. Later, additional phagocytosis is accomplished by 'fixed' phagocytes in the loose connective tissue and by cells that line hemolymph sinuses of the heart, gill, and abdomen. Collagen-like fibers are typically seen in association with wound healing and in the process of encapsulation in these animals.

COM-75-50185-05-06-03/GA
(Order as COM-75-50185-05-06)
Iowa State Univ., Ames. Dept. of Zoology and Entomology.
The Immunological Mechanisms of the Horseshoe Crab, 'Limulus polyphemus',
John I. Stagner, and James R. Redmond. Jun 75, 10p NOAA-75071001-3, MFR-Paper-1141
Included in Marine Fisheries Review, v37 n5-6 p11-19 May-Jun 75.

Descriptors: *Crabs, *Immunology, Proteins, Agglutinins, Pathology, Arthropoda, Bacteria, In vitro analysis, Exposure, Sea water, Immunity, Water pollution.
Identifiers: Limulus polyphemus, Horseshoe crabs.

The immunological system of Limulus polyphemus is composed of a series of protein agglutinins that may be demonstrated to be distinct from one another by various immunochemical methods. The hemolymph agglutinates bacteria in vitro and inhibits bacterial growth. Hemocyte lysates, which are endotoxin sensitive and remove endotoxin by gelatin, also agglutinate bacteria and inhibit bacterial growth in culture. A third aspect of the immune system is a glycoprotein exudate produced by hypodermal glands and secreted through canals in the carapace. The exudate serves as a mechanical barrier to pathogens due to its viscosity and has agglutinating properties. It is produced in response to injection of bacterial endotoxin or exposure to fouled seawater and inhibits bacterial cultures. Like Limulus polyphemus heteroagglutinin, it immobilizes bacteria by binding the flagella or by rendering them inactive.

COM-75-50185-05-06-04/GA
(Order as COM-75-50185-05-06)
Fisheries Research Board of Canada, Halifax (Nova Scotia). Halifax Lab.
Gaffkemia, the Fatal Infection of Lobsters (Genus 'Homarus') Caused by 'Aerococcus viridans (var.) homari': A Review,
James E. Stewart. Jun 75, 6p NOAA-75071001-4, MFR-Paper-1142
Included in Marine Fisheries Review, v37 n5-6 p20-24 May-Jun 75.

Descriptors: *Lobsters, *Micrococcaceae, *Fish diseases, Septicemia, Bacterial diseases, Crustacea, Marine biology, Infectious diseases, Mortality, Salinity, Reviews.
Identifiers: *Homarus, Aerococcus viridans.

A review of recent literature is given concerning the fatal septicemia in lobsters caused by the bacterium, Aerococcus viridans (var.) homari (formerly Gaffkya homari). Decreasing salinity may increase or decrease the time to death in lobsters, depending upon whether or not the animals have been infected before or after the salinity change occurred. As the disease progresses, glycogen, ATP, glucose, lactic acid, and nonprotein nitrogen all decrease. Impairment of the major metabolic processes is suggested as the probable cause of death. A degree of host resistance can be induced by administration of appropriate vaccines.

COM-75-50185-05-06-05/GA
(Order as COM-75-50185-05-06)
National Marine Fisheries Service, Galveston, Gulf Coastal Fisheries Center.
A Septicemic Bacterial Disease Syndrome of Penaeid Shrimp,
Donald V. Lightner, and Donald H. Lewis. Jun 75, 5p MFR-Paper-1143, Contrib-372 NOAA-75071001-5
Prepared in cooperation with Texas A and M Univ., College Station. Dept. of Veterinary Microbiology. Included in Marine Fisheries Review, v37 n5-6 p25-28 May-Jun 75.

Descriptors: *Shrimps, *Septicemia, Bacterial diseases, Mortality, Fish diseases, Pathology, Aquaculture, Fisheries, West Galveston Bay.
Identifiers: Penaeus setiferus, Penaeus aztecus, Penaeus duorarum, Vibrio alginolyticus, Vibrio anguillarum.

A disease syndrome of penaeid shrimp characterized by the presence of a septicemic phase is described. Mortality due to the disease in infected shrimp populations typically ranged from 10 to 50%, but occasionally reached 100%. Vibrio alginolyticus, Vibrio anguillarum, and an Aeromonas species were isolated from moribund hatchery-reared white shrimp (Penaeus setiferus) and brown shrimp (Penaeus aztecus) and from wild white, brown, and pink shrimp (Penaeus duorarum). Each of these organisms were found to be pathogenic to shrimp when administered by intramuscular injection.

COM-75-50185-05-06-06/GA
(Order as COM-75-50185-05-06)
Maryland Univ., College Park. Dept. of Microbiology.
A Comparative Study of the Bacterial Flora of the Hemolymph of 'Callinectes sapidus',
R. R. Colwell, T. C. Wicks, and H. S. Tubiash. Jun 75, 6p NOAA-75071001-6, MFR-Paper-1144 Grants NOAA-04-3-158-7, NSF-GB-35261
Prepared in cooperation with Georgetown Univ., Washington, D.C. Dept. of Biology, and National Marine Fisheries Service, Oxford, Md. Biological Lab. Included in Marine Fisheries Review, v37 n5-6 p29-33 May-Jun 75.

Descriptors: *Crabs, *Bacteria, *Chesapeake Bay, Shellfish, Bacteriology, Aquatic microbiology, Culture media, Agar, Sampling, Taxonomy, Numerical methods, Classifications.
Identifiers: *Callinectes sapidus, Vibrio parahaemolyticus.

The bacterial flora of blue crabs (Callinectes sapidus) from Chesapeake Bay was examined. A comparison of crab data with that of Chesapeake Bay oysters revealed a qualitative difference in that the crab hemolymph flora was almost entirely Vibrio species, whereas the oyster flora included species of a variety of other genera.

COM-75-50185-05-06-07/GA
(Order as COM-75-50185-05-06)
Washington Cooperative Fishery Unit, Seattle.
Serum Changes in the Blue Crab, 'Callinectes sapidus', Associated with 'Paramoeba perniciosa', the Causative Agent of Gray Crab Disease,
Gilbert B. Pauley, Martin W. Newman, and Edith Gould. Jun 75, 6p NOAA-75071001-7, MFR-Paper-1145
Prepared in cooperation with National Marine Fisheries Service, Oxford, Md. Middle Atlantic Coastal Fisheries Center, and National Marine Fisheries Service, Milford, Conn. Middle Atlantic Coastal Fisheries Center. Included in Marine Fisheries Review, v37 n5-6 p34-38 May-Jun 75.

Descriptors: *Crabs, *Fish diseases, Amoeba, Pathology, Blood serum, Crustacea, Blood proteins, Hemocyanins, Correlation techniques.
Identifiers: *Callinectes sapidus, Paramoeba perniciosa.

Hemolymph from healthy blue crabs (Callinectes sapidus) was compared with that of animals infected with Paramoeba perniciosa, the causative agent of gray crab disease. There was a significant difference ($P=0.01$) between normal and gray crab sera in both the protein and the glucose values. Analysis of infected blue crab serum by both immunoelectrophoresis and acrylamide gel electrophoresis showed altered patterns of total protein and hemocyanin that could be accurately correlated with the severity of the disease.

COM-75-50185-05-06-08/GA
(Order as COM-75-50185-05-06)
Biologische Anstalt Helgoland (West Germany).
Microsporidian Infections of Amphipods with Special Reference to Host-Parasite Relationships: A Review,
H. P. Bulnheim. Jun 75, 8p NOAA-75071001-8, MFR-Paper-1146
Included in Marine Fisheries Review, v37 n5-6 p39-45 May-Jun 75.

Descriptors: *Crustacea, *Fish diseases, Infectious diseases, Parasitic diseases, Spores, Parasites, Marine biology, Taxonomy, Morphology.
Identifiers: Gammarus duebeni, Octosporea effeminans, Thelohania herediteria.

A survey of the 10 species of microsporidians associated with amphipod crustaceans is presented. Specific features for their recognition are given on taxonomy, morphology, spore size, sites of infection, and host range. Some aspects of the host-parasite relationships are considered. In several species, transovarian transfer appears to be a major route of transmission. Previous results on microsporidians indicate that they do not cause fatal diseases in their amphipod hosts. A sex-determining influence on the progeny of Gammarus duebeni after infection by Octosporea effeminans or Thelohania herediteria is indicated. Both of these microsporidians are transmitted through the eggs to the host's offspring which, in general, all develop into females. Some results and problems of this effect on sex ratio are discussed.

COM-75-50185-05-06-09/GA
(Order as COM-75-50185-05-06)
Virginia Inst. of Marine Science, Gloucester Point.
Fine Structure of 'Minchinia' sp. (Haplosporida) Sporulation in the Mud Crab, 'Panopeus herbstii',
Frank O. Perkins. Jun 75, 16p NOAA-75071001-9, MFR-Paper-1147
Included in Marine Fisheries Review, v37 n5-6 p46-60 May-Jun 75.

Descriptors: *Crabs, *Spores, Fish diseases, Morphology, Crustacea, Pathology, Cytology, Meiosis.
Identifiers: *Panopeus herbstii, Minchinia, Mud crabs.

Morphogenetic changes that accompany sporulation of Minchinia sp. in the mud crab (Panopeus herbstii) are described. Small (4-19 micrometers diameter) plasmodia increase in size and numbers of nuclei per cell to form sporonts with a delimiting wall. Sporonts cleave into uninucleate sporoblasts following one of two pathways. In presumably 'normal' sequence, a cytoplasmic syncytium is formed followed by cleavage into uninucleate sporoblasts. In the other, sporont protoplasm is asynchronously 'carved' into uni- or binucleate sporoblasts or sproroplasms as a result of delimitation at the surface and internally. A sporoplasm is then delimited in each sporoblast and spore maturation follows.

COM-75-50185-05-06-10/GA
(Order as COM-75-50185-05-06)
Clemson Univ., S.C. Dept. of Botany.
A Brief Review of the Involvements of 'Lagenidium,' an Aquatic Fungus Parasite, with Arthropods,
Clyde J. Umphlett, and E. M. McCray, Jr. Jun 75, 5p NOAA-75071001-10, MFR-Paper-1148
Prepared in cooperation with Public Health Service, Savannah, Ga. Technical Development Labs. Included in Marine Fisheries Review, v37 n5-6 p61-64 May-Jun 75.

Descriptors: *Arthropoda, *Fungi, *Parasites, Parasitic diseases, Fish diseases, Pathology, Crustacea, Chesapeake Bay, North Carolina, Reviews.
Identifiers: Lagenidium callinectes, Chelonibia patula, Lagenidium chthamalophilum, Chthamalus fragilis, Lagenidium giganteum, Penaeus aztecus, Penaeus setiferus.

Several species of the genus Lagenidium, an aquatic planomycetous fungus, have been reported as parasites of arthropods. Lagenidium callinectes, a superficial parasite of egg masses of the blue crab, has been found occasionally on as many as 40% of egg masses collected from Cheaspeake Bay waters. The same species has been found as a parasite in the ova of the barnacle Chelonibia patula off the North Carolina coast. A second species, Lagenidium chthamalophilum, has been observed in gill lamellae of the barnacle Chthamalus fragilis. A Lagenidium sp. has been observed in laboratory-reared brown shrimp, Penaeus aztecus, and white shrimp, Penaeus setiferus. Lagenidium giganteum is a virulent pathogen of several species of culicine mosquito larvae, with over 90% of test larvae in laboratory experiments killed consistently. Lagenidium giganteum has been shown to be an effective larval pathogen under field conditions.

JPRS-65134 PC$3.75/MF$2.25
Joint Publications Research Service, Arlington, Va.
Catalog on the Study of the Resistance of Wheat to Types of Common Bunt,
V. I. Krivchenko, and D. V. Myagkova. 2 Jul 75, 50p
Trans. of mono. Katalog po Izucheniyu Ustoichivosti Pshenitsy k Vidam Tverdoi Golovni, Number 79, Leningrad, 1971 p1-53.

Descriptors: *Wheat plants, *Fungus diseases, Plant breeding, Plant physiology, Plant anatomy, Plant diseases, Tolerances(Physiology), Translations, USSR.

The report contains a catalog on the study of the resistance of wheat to types of common bunt.

JPRS-65141 PC$4.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
Catalog of Wheat Samples Characterized by Definite 'Resistant' Genes to Brown Rust,
V. F. Dorofeev. 3 Jul 75, 71p
Trans. of mono. Katalog Obraztsov Pshenits, Kharakterizuyushchikhsya Opredelennymi Genami Ustoichivosti k Buroi Rzhavchine, No. 3, Leningrad, 1973 p3-75.

Descriptors: *Wheat plants, *Plant genetics, *Rusts(Fungi), Plant anatomy, Sampling, Plant diseases, Plant physiology, Translations, USSR.
Identifiers: Puccinia recondita.

The report contains a catalog of wheat samples characterized by definite 'resistant' genes to brown rust. The catalog includes a generalization of the results from studying a Dagestan population of brown rust and the particular features of resistance to this disease in 400 wheat samples from the world collection of the VIR.

JPRS-65214 PC$4.75/MF$2.25
Joint Publications Research Service, Arlington, Va.
Protection of Wheat Against Rust,
A. E. Chumakov. 11 Jul 75, 82p
Trans. of mono. Zashchita Pshenitsy ot Rzhavchiny, Leningrad, 1964 p5-99.

Descriptors: *Wheat plants, *Rusts(Fungi), Plant genetics, Damage, Protection, Pest control, Plant diseases, Distribution(Property), Plant anatomy, Translations, USSR.

The report contains data on methods employed in the protection of wheat against rust.

UCSD-34P133X8 PC$4.00/MF$2.25
California Univ., San Diego, La Jolla Dept. of Biology.
Genetic Control of Enzyme Formation.
S. E. Mills. 7p
Contract AT(04-3)-34

Descriptors: (*Ligases, *Genetics), (*Transferases, Genetics), (*Escherichia coli, *Genes), (*Bacteria, Genes), Biosynthesis, Euglena, Immune serums, Maize, Molecular structure, Molecular weight, Peas, Rabbits, Tryptophan.

No abstract available.

6D. Bionics

AD-A013 649/9GA PC$4.25/MF$2.25
California Univ Los Angeles School of Engineering and Applied Science
Biocybernetic Control in Man-Machine Interaction.
Semi-annual technical rept. 1 Jul 74-31 Jan 75,
Jacques J. Vidal, and Marshall D. Buck. Mar 75, 60p Rept no. UCLA-ENG-7535
Contract N00014-69-A-0200-4055, ARPA Order-2816

Descriptors: *Cybernetics, *Man machine systems, *Electroencephalography, Brain, Senses(Physiology), Visual signals, Response(Biology), Stimulation(Physiology), Computer applications.
Identifiers: Evoked responses, *Communication theory.

The research program aims at incorporating EEG 'evoked responses' in man-machine communication. A methodology for the real-time discrimination of evoked responses by a computer in real-time has been developed. Extremely high rates of sensory stimulus identification from EEG have been achieved. The experimental paradigm has been completely implemented on the laboratory computer system. Experiments are now in progress that involve the EEG discrimination algorithm in an actual man-machine communication procedure.

AD-A013 669/7GA PC$3.75/MF$2.25
Massachusetts Inst of Tech Cambridge Artificial Intelligence Lab
The Low-Level Symbolic Representation of Intensity Changes in an Image,
David Marr. Dec 74, 44p Rept no. AI-M-325
Contract N00014-70-A-0362-0005

Descriptors: *Visual perception, *Artificial intelligence, *Information processing, Intensity, Cats, Edges, Computers, Symbols, Gradients, Profiles, Vision, Algorithms, Shape, Luminescence, Images.
Identifiers: Edge detection.

A family of symbols is defined by which much of the useful information in an image may be represented, and its choice is justified. The family includes symbols for the various commonly occurring intensity profiles that are associated with the edges of objects, and symbols for the gradual luminance changes that provide clues about a surface's shape. It is shown that these descriptors may readily be computed from measurements similar to those made by simple cells in the visual cortex of the cat. (Author)

6E. Clinical Medicine

AD-A013 596/2GA PC$4.25/MF$2.25
Naval Dental Research Inst Great Lakes Ill
Conference on Navy Plaque Control Program Held at the Naval Dental Research Institute, Great Lakes, Illinois on 19-21 March 1975,
Harris J. Keene, Milton R. Wirthlin, and Sanford A. Glazer. Jul 75, 65p Rept no. NDRI-PR-75-08

Descriptors: *Dental plaque, *Conferences, *Preventive dentistry, Cost effectiveness, Marine Corps personnel, Naval personnel, Recruits, Naval shore facilities, Military medicine, Navy, Control, Effectiveness, Reduction, Dental caries, Gingivitis, Oral hygiene, Medical technicians, Medical personnel.
Identifiers: Military academies.

This conference was convened to review the Navy Plaque Control Program; evaluate its effectiveness in reducing disease in the Navy and Marine Corps populations; determine if a cost-benefit ratio can be derived; and propose measures, if necessary, for achieving a more cost-effective program. The current program was reviewed in different settings, and the scientific basis of the program was evaluated. It was generally agreed that physical removal of dental plaque by individuals may control gingivitis, but there was no long-term evidence in a naval population. Physical control of dental plaque to prevent dental caries had no clear-cut evidence in the scientific literature. Research can help evaluate the existing program and new concepts of prevention, and determine cost-effectiveness of proposals before being implemented by management.

AD-A013 631/7GA PC$7.25/MF$2.25
Naval Postgraduate School Monterey Calif
The Civilian Health and Medical Program for the Uniformed Services (CHAMPUS).
Master's thesis,
Leland Richard Maassen. Jun 75, 202p

Descriptors: *Military medicine, *Medical services, Management, Organizations, Budgets, Accounting, Benefits, Theses.
Identifiers: *Health insurance, CHAMPUS(Civilian Health and Medical Program of the Uniformed Services), *Civilian Health and Medical Program of the Uniformed Services.

A study of the Civilian Health and Medical Program for the Uniformed Services (CHAMPUS) was conducted to identify the structure and organizational relationships existing within the Program. The legislative history of dependent medical care programs was traced to show the Congressional intent behind the CHAMPUS Program. Procedures used by several levels of management in the CHAMPUS Program to process beneficiary claims were reviewed and examined. Budgeting, accounting, and reporting systems in use were reviewed in an attempt to demonstrate the growth of the program during the past seven years of its existence. The results of the study demonstrate the complexity of the CHAMPUS Program. It further points out the need for further indepth study in several aspects of the program's management.

AD-A013 658/0GA PC$5.25/MF$2.25
Naval Postgraduate School Monterey Calif
A Preliminary Feasibility Study of the Establishment of a Health Maintenance Organization on the Monterey Peninsula.
Master's thesis,
Normand L. Charland, and Arlene E. Mills. Jun 75, 105p

Descriptors: *Public health, *Medical services, Physicians, Law, Medical personnel, Organizations, Military dependents, Civilian population, Models, Medicine, Medical personnel, Standards, Requirements, Methodology, Theses, Feasibility studies.
Identifiers: Monterey Peninsula(California).

The feasibility of establishing a health maintenance organization (HMO) on the Monterey Peninsula is examined. A brief history of the HMO is presented along with principles believed necessary for the HMO's success. Organizational structures of HMOs are reviewed and some of the advantages and disadvantages over conventional methods are discussed. The advantages heavily outweigh the disadvantages. Some of the major legislation, both Federal and State, impacting on HMOs are summarized. The existing health care delivery system on the Peninsula is thoroughly examined to discover what problems exist that might be corrected by the establishment of an HMO. Also the effect of the possible shift of military dependent care to the civilian community is considered. Three possible HMO models are presented for consideration along with suggestions for easing some of the resistance that may evolve. (Author)

AD-A013 695/2GA PC$3.25/MF$2.25
Naval Medical Research Unit No 3 Fpo New York 09527
Echinococcosis in Egypt: Evaluation of the Indirect Haemagglutination and Latex Agglutination Tests for Echinococcal Serologic Surveys.
Technical scientific rept.,
B. A. M. Botros, R. W. Moch, and I. S. Barsoum. 1973, 9p Rept no. NAMRU-3-TR-58-74
Availability: Pub. in Jnl. of Tropical Medicine and Hygiene, v76 p243-247 Sep 73.

Descriptors: *Serology, Egypt, Hemosporidia, Schistosoma, Parasites, Agglutinins, Reprints.
Identifiers: *Echinococcosis.

Sera obtained from rabbits immunised with schistosomal antigen reacted with echinococcal antigen in the IHA test but not in the LA test. This indicates that schistosomal antibodies non-specifically react with echinococcal antigen in the IHA test but not in the LA test. Sera from three human populations were examined for their reactivity with echinococcal antigen by the IHA and LA tests. Thirty-six per cent of schistosome proven human cases, 23.8 per cent of farmers who most probably have or have had schistosomiasis and 5.3 per cent of presumably schistosome free humans were IHA positive. In the LA test, 5.6 per cent, 2.7 per cent and 0.28 per cent of those three groups respec-

tively were positive. Schistosomal antibodies cross reacting with echinococcal antigen most probably accounts for the significantly high prevalences obtained in the IHA test. In Egypt, where schistosomiasis is an endemic disease with an incidence of over 60 per cent, the use of the IHA test alone for echinococcosis surveys is therefore not recommended. The LA test being more specific, though less sensitive, should give more reliable results. A combination of the LA test with other serological tests such as the BF test is recommended for echinococcal serologic surveys in Egypt. (Author)

AD-A013 697/8GA PC$3.25/MF$2.25
Naval Medical Research Unit No 3 Fpo New York 09527
Serum Glycoproteins and Malaria in Ethiopia.
Technical scientific rept.,
Wagdy Mousa, David R. Ten Eyck, and Carol I. Waslien. 11 Jul 73, 10p Rept no. NAMRU-3-TR-53-74
Availability: Pub. in Jnl. of Laboratory and Clinical Medicine, v82 n6 p924-929 Dec 73.

Descriptors: *Malaria, Serology, Ethiopia, Glycoproteins, Parasites, Epidemiology, Reprints.
Identifiers: Sialic acids.

Sera from an area of Ethiopia where malaria is endemic were compared with those of residents of the Ethiopian highlands where malaria is not endemic but is found in the acute form. The Alpha sub 1-glycoprotein electrophoretic fraction was increased in 54 per cent of the Ethiopians with acute malaria and 28 per cent of those with chronic parasitemia compared with noninfected control subjects from the same regions. Lesser changes were observed in the 'glycoalbumin' and Alpha sub 2-glycoprotein fractions and no change in the B- and gamma-glycoglobulin. Seromucoid levels were elevated in approximately 1/4 of the sera from acute or chronic malaria and correlated with the rise in the total Alpha sub 1-glycoprotein fraction. Protein bound hexose was increased in only a few sera from acute cases but in 3/4 of those cases with chronic malaria and possibly reflects parenchymatous liver disease. Significant elevations in sialic acid were seen only in chronic malaria. Total protein fractions showed the same trends as the glycoproteins but to lesser degree. (Author)

AD-A013 701/8GA PC$3.25/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
Relationship of Serum Beta-Glucuronidase and Lysozyme to Pathogenesis of Tularemia in Immune and Nonimmune Rats,
Peter G. Canonico, M. C. Powanda, G. L. Cockerell, and J. B. Moe. 26 Feb 75, 6p
Availability: Pub. in Infection and Immunity, v12 n1 p42-47 Jul 75.

Descriptors: *Tularemia, Biochemistry, Enzymes, Pathogenesis, Serology, Dosage, Response(Biology), Rats, Reprints.
Identifiers: *Serum beta glucuronidase, *Lysozyme, *Beta-glucuronidase.

A temporal study is reported of the febrile responses, tissue bacterial contents, and serum concentration of the lysosomal enzymes, beta-glucuronidase and lysozyme, in nonimmune rats inoculated with virulent or attenuated strains of Francisella tularensis, and in immune rats challenged with either a high or low dose of virulent organisms. The level of serum beta-glucuronidase appears to be an indicator of hepatocyte damage, whereas serum lysozyme correlates with the appearance, frequency, and severity of pyogranulomatous lesions. Survival of nonimmune rats after a challenge with either virulent or attenuated organisms appears to depend on a balance between dose of bacterial inoculum, celerity of irreversible pathologic events, and the ability of the reticuloendothelial and immune systems to collaboratively mount a response to limit or prevent dissemination of the infection. In immune rats, infection of parenchymal hepatic cells does not occur after a low dose (10 to the 4th power) virulent challenge. Infection of parenchymal hepatic cells, however, does occur in immunized rats when the challenge dose is sufficiently large (10 to the 8th power) so as to overcome the capacity of the reticuloendothelial to clear opsonized organisms. (Author)

AD-A013 764/8GA PC$3.25/MF$2.25
Texas Univ Health Science Center San Antonio Dept of Pharmacology
Left Ventricular Function during Acute Regional Myocardial Ischemia in the Conscious Dog,
Vernon S. Bishop, Robert L. Kaspar, George E. Barnes, and Merrill B.Kardon. 4 Jan 74, 10p AFOSR-TR-75-1142
Grants AF-AFOSR-2074-71, PHS-HL-12415
Availability: Pub. in Jnl. of Applied Physiology, v37 n6 p785-792 Dec 74.

Descriptors: *Cardiovascular system, *Coronary disease, Dogs, Myocardium, Muscles, Fibers, Blood flow, Blood pressure, Reprints.

The effects of acute 1-min occlusion of the left circumflex coronary artery on the inotropic state and performance of the left ventricle were examined in adult mongrel dogs. The inotropic state, as indicated by changes in the maximum derivative of left ventricular pressure in the preejection phase and the maximum derivative of the transverse internal diameter, were diminished during the ischemic period. The end-systolic diameter increased 3.8 + or - 0.6 mm while the end-diastolic diameter increased only 0.4 + or - 0.2 mm, although the end-diastolic pressure increased 6.9 + or - 0.6 mm Hg. Progressive decreases in the stroke volume paralleled the apparent reduction in myocardial fiber shortening in the transverse plane. Cardiac output and arterial pressure declined, concurrently, thus maintaining a constant peripheral resistance during the occlusion. Acute coronary occlusion also caused an apparent increase in the myocardial wall stiffness as judged by the increase in the slope a of the equation dP/dV = aP + B, the increase of the slope of the pressure-diameter relationship, and the decrease in the rate of lengthening of the diameter during diastole. These findings suggest that acute myocardial ischemia results in an immediate reduction in the effective inotropic state and an apparent increase in the myocardial wall stiffness in the transverse plane. Both of these changes resulted in a decrease in performance of the left ventricle. (Author)

BNL-19894 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Short-Lived Radiopharmaceuticals for the Diagnosis of Ocular Melanoma.
S. Packer, R. Lambrecht, H. L. Atkins, and A. P. Wolf. 1974, 19p CONF-750318-1

Descriptors: (*Melanomas, *Diagnosis), (*Eyes, Melanomas), Diagnostic techniques, Labelled compounds, Lead 203, Nuclear medicine, Radionuclide administration, Radiopharmaceuticals, Scintiscanning, Testing.

For abstract, see NSA 32 03, number 06882.

BNL-20031 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Loss of Calcium from Axial and Appendicular Skeleton in Patients with Chronic Renal Failure.
S. H. Cohn, K. J. Ellis, R. C. Caselnova, S. N. Asad, and J. M. Letteri. 1974, 7p

Descriptors: (*Patients, Uremia), (*Uremia, *Diagnosis), (*Calcium, *Activation analysis), (*Bone tissues, Activation analysis), Excretion, Kidneys, Metabolism, Minerals, Photon transmission scanning, Physiology, Skeleton, Urogenital system diseases, Whole-body counting.

For abstract, see NSA 32 03, number 06883.

COO-3333-10 PC$4.00/MF$2.25
Massachusetts General Hospital, Boston.
New Imaging Systems in Nuclear Medicine. Technical Progress Report, July 1, 1974--April 1, 1975.
G. L. Brownell. 1975, 15p
Contract AT(11-1)-3333

Descriptors: Brain, Cardiovascular diseases, Diagnosis, Gallium 68, Heart, Images, Labelled compounds, Lungs, Nitrogen 13, Nuclear medicine, Oxygen 15, Patients, Positron cameras, Radionuclide administration, Radiopharmaceuticals, Rubidium 82, Scintiscanning.

For abstract, see NSA 32 03, number 06884.

COO-3399-9 PC$4.00/MF$2.25
Pennsylvania Univ., Philadelphia Dept. of Radiology.
Development of Scan Analysis Techniques Employing a Small Computer. Progress Report, August 1, 1974--July 31, 1975.
D. E. Kuhl. 1975, 7p
Contract AT(11-1)-3399

Descriptors: (*Brain, Blood flow), (*Blood flow, *Measuring methods), Computer calculations, Counting techniques, Diagnostic techniques, Nuclear medicine, Patients, Radioisotope scanners, Radionuclide administration, Scintiscanning.

For abstract, see NSA 32 03, number 06885.

PATENT-3 632 774 Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
Method of Treating Rheumatoid Arthritis with Histidine.
Patent,
Donald A. Gerber. Filed 30 Mar 70, patented 4 Jan 72, 2p PAT-APPL-23 993,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Histidine, *Rheumatoid arthritis, Immunologic diseases, Musculoskeletal disorders, Therapy, Amino acids, Dosage.
Identifiers: PAT-CL-424-319.

The invention relates to a method for relieving symptoms and effects associated with rheumatoid arthritis. More particularly, this invention is concerned with a method of relieving such symptoms and effects by the administration of effective dosages of histidine or non-toxic histidine salts.

PB-243 069/2GA PC$3.75/MF$2.25
General Research Corp., McLean, Va.
HMO Cost Study.
Costs analysis rept. on Task 2,
Ferd H. Mitchell, Rick Johnson, and Sue Drymaalski. 29 Mar 74, 32p HSA-74-10-2
Contract HSA-105-74-10
Prepared in cooperation with Health Application Systems, Burlingame, Calif.

Descriptors: *Medical services, Cost analysis, Simulation, Physicians, Utilization, Hospitals, Models, United States.

Identifiers: *Health maintenance organizations, Health care delivery systems, *Health care costs.

The study provided a cost analysis of the HMO benefits package as defined by the Health Maintenance Organization Act of 1973 (P.L. 93-111) and related HEW draft regulations in a sample of HMOs of the independent practice association types. Data from a wide variety of existing HMOs and actuarial consultants were collected, reviewed, and analyzed. From the foregoing data, cost-estimating models were synthesized and used to estimate the costs for services required under P.L. 93-222 draft regulations. The models were applied to produce an estimated HMO monthly premium cost for the average individual and the average family in the United States.

PB-243 109/6GA PC$12.00/MF$2.25
American Hospital Association, Chicago, Ill.
Health Occupations Training Programs Administered by Hospitals. A Directory.
Oct 73, 498p HRA/OC-76/013, DHEW/HRA-75/27
Contract N01-MI-24315

Descriptors: *Directories, *Medical personnel, *Nursing, Training programs, Hospitals, Requirements, Surveys, Questionnaires.
Identifiers: *Medical education, *Allied health personnel.

The directory provides information on 4,013 allied health and nursing training programs administered by hospitals in the United States as of October 1973. It consists of two sections: I. Guide to Training Programs, designed primarily for guidance counselors, students, and health planners, contains an alphabetical listing of training programs classified within major occupational categories. Information is provided on program length, educational entrance requirements, and number of graduates. Section II. Guide to Hospitals, designed primarily for hospital administrators and health planners, presents an alphabetical listing by State and city of those hospitals having training programs.

PB-243 110/4GA PC$6.25/MF$2.25
South Carolina Hospital Association, West Columbia.
A Statewide Plan to Train Emergency Medical Technicians.
Final rept. 30 Jun 71-29 Jun 72.
29 Jun 72, 161p HRA/OC-76/015
Contract PHS-71-4163

Descriptors: *Medical personnel, Training programs, Education, Planning, Questionnaires, Surveys, Video tapes, Training devices, Projects, South Carolina.
Identifiers: *Emergency medical services, Health manpower.

During the 12 months beginning 6/30/71, the South Carolina Hospital Association, in cooperation with a number of other state and voluntary health agencies, undertook a statewide project to provide basic emergency medical technicians training, to test the feasibility of using videotaped presentations for a portion of this training, to develop personal attributes are predictive of success in the course, and to create cooperative inter-organizational voluntary structures on both a state and community basis to guide the initial effort and to ensure the continuation of necessary EMT training. As evidenced in the body of this report, all objectives were accomplished to a reasonable degree of satisfaction. A statewide inter-organizational Advisory Committee was formed to guide the project and proved to be effective in directing the project, resolving conflicts and solving operational problems as they arose.

PB-243 130/2GA PC$5.25/MF$2.25
Maryland Hospital Education and Research Foundation, Lutherville.
Equivalency Testing for Allied Health Manpower in Maryland. Conference Proceedings, October 19-20, 1971.
1971, 101p HRA/OC-76016
Contract PHS-71-4165

Descriptors: *Maryland, *Medical personnel, *Meetings, Manpower, Utilization, Recommendations, Equivalence, Tests, Qualifications.
Identifiers: *Allied health personnel, *Health manpower, Health care delivery systems.

The report represents a compilation of seminar presentations which focus attention on equivalency testing within the State of Maryland. The presentations made at the meeting and the recommendations developed in the work sessions are included as they were submitted at the seminar, with minimal editing.

PB-243 210/2GA PC$4.25/MF$2.25
King Edward VII Memorial Hospital, Bombay (India). Dept. of Cardiology.
Rehabilitation of Cardiac Patients.
Final rept.,
K. K. Datey. May 74, 64p SRS-19-58111-001
Grant SRS-19-58111
Prepared in cooperation with Central Railway Headquarters Hospital, Bombay (India).

Descriptors: *Cardiovascular diseases, *Rehabilitation, *Myocardial infarction, Heart diseases, Hypertension, Patients, Physical therapy, Exercise(Physiology), India.

The five and one-half year study to evaluate methods of rehabilitating cardiac patients found that programs for rehabilitation must be individualized according to preconditions and guidelines given in detail in the report. The yoga exercise 'Shavasan' was found to be beneficial in heart disease as well as hypertension. A two year follow-up study of patients with acute myocardial infarction in which parameters observed during the acute phase were correlated with later progress provided a basis for long term prognosis. The objective of the program was to recondition patients so they could perform at their maximum capacity as soon as possible. Various types of heart disease were studied but the emphasis was on acute myocardial infarction.

PB-243 643/4GA PC$12.00/MF$2.25
National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research, Bethesda, Md.
Transcript of Meeting (4th), Held on 14-15 March 1975.
15 Mar 75, 486p NCPHS/M-75/4

Descriptors: *Meetings, *Embryos, Humans, Experimentation, Research, Ethics, Death, Viability, Legislation, Instructions.
Identifiers: *Medical ethics, *Medical research, Biomedicine.

The edition is the transcript of the March 14-15, 1975 meeting. The Commission heard testimony on Federal agency roles in research on the fetus. Representatives from the Food and Drug Administration, the National Institute of Child Health and Human Development, and the Population Division of HEW addressed the Commission. A summary of final report to the Commission on legal issues in research on the fetus was presented by Professor John Wilson. A summary of the Battelle Institute report on the role of research involving living fetuses in advances in medical science and technology was presented. Members heard a summary of Dr. Richard Behrman's report to the Commission on guidelines for determining fetal death and viability. Members discussed contract plans for the 'special study' to investigate ethical, social, and legal implications of future advances in biomedicine.

PB-243 659/0GA PC$4.25/MF$2.25
Transaction Systems, Inc., Atlanta, Ga.
HSA Work Planning and Monitoring System: User Manual,
Richard Leatherwood. 1975, 68p HSA-74-9-12/18
Contract HSA-105-74-9

Descriptors: *Medical services, Planning, Documentation, Evaluation, Utilization, Monitors, Effectiveness, Systems engineering, Manuals, Characteristics, Requirements, Resources.

The document outlines the operational procedures and characteristics of the 1974 Work Planning and Monitoring System for the Health Services Administration (HSA) PHS/DHEW. The document consists of 4 chapters and 3 appendices: Overview of the system; procedures; monitoring; and format for documentation preparation. In the overview, the system is described as a mechanism for interaction between HSA components in developing and administering activities for desired programmatic and management results. It specifies capabilities and benefits of the system and defines the basic design. In the section entitled, procedures, the method for development and approval of work plans is delineated. Theses plans reflect desired goals for the approaching fiscal year and activities necessary for achievement. The monitoring section describes the method and frequency of recording the progress of activity. The last section, document preparation, provides guidance regarding the content and format of principle WPMS documents.

PB-243 699/6GA PC$9.25/MF$2.25
Santa Clara County Heart Association, San Jose.
A Plan for an Emergency Medical Services System for Santa Clara County.
Topic rept.,
Richard Alexander, Thomas J. Castor, and Michael S. Clinkenbeard. Jan 75, 317p CRMP-146D-1
Prepared in cooperation with California Regional Medical Program, Oakland, Ad Hoc Steering Committee for Coordination of Emergency Medical Services, in Santa Clara County, San Jose, and Santa Clara County Emergency Medical Care Committee, San Jose.

Descriptors: *Medical services, California, Planning, Systems analysis, Recommendations, Design, Decision making, Coordination, Cooperation, Systems engineering, Objectives.
Identifiers: Santa Clara County(California), *Emergency medical services, Agencies, Community health services.

A plan to develop a comprehensive system for providing emergency medical services to Santa Clara County residents was drafted by health professionals and representatives from the various institutions and agencies involved in EMS in the county. The plan was reviewed by the County Emergency Medical Care Committee, and approved in principle by the County Board of Supervisors. The report provides a conceptual design and framework for critical decision-making and optimizing system operation. Cooperation of all agencies and cities will be required to implement the plan and achieve an effective system. Coordination with regional, state and federal plans must also be reflected in the process. The plan includes sections on goals and objectives; system definitions and requirements; inventories of facilities, services and agencies; implementation; funding; special problems; and recommendations.

PB-243 707/7GA PC$7.25/MF$2.25
Transaction Systems, Inc., Atlanta, Ga.

Menominee Tribe Health Care Program Planning.
Final rept.,
Richard Leatherwood. 25 Apr 75, 206p HSA-74-9-13
Contract HSA-105-74-9
Prepared in cooperation with Menominee Restoration Committee, Keshena, Wis.

Descriptors: *Medical services, Design, Wisconsin, Interviews, Organizations, Planning, Recommendations, Wisconsin, Requirements, Financing, Surveys, Tables(Data).
Identifiers: *American Indians, *Health care delivery systems, Health care facilities.

The purpose of the project was to design a health care program and implementation plan for use by the Menominee Indians in Wisconsin. Central to the project was an assessment of tribal health care needs and the evaluation of available services and facilities. Data on health care needs and available services both from on-site investigation and interviews as well as secondary sources were compiled. Health service needs were compared with available effective services to determine the nature and magnitude of unmet needs and the corresponding requirements for services. Specific recommendations are made including what health services are needed, how they could be financed and organized, when they could be instituted and how responsibility for administering the services could be allocated.

PB-243 709/3GA PC$7.50/MF$2.25
General Research Corp., McLean, Va.
Evaluation of the Accomplishments of Selected HMOS-Funded Projects.
Final rept.,
James S. Lubalin, John J. McCord, Ronald B. Zisk, Juliette C. Muscat, and Daniel Z. Louis. 15 Dec 74, 243p* HSA-74-10-3
Contract HSA-105-74-10
See also PB-243 710.

Descriptors: *Medical services, Projects, Performance evaluation, Recommendations, Health insurance, Financing, Marketing, Management.
Identifiers: *Health maintenance organizations, Health care delivery system, *Group health plans.

A sample of 22 Health Maintenance Organization (HMO) projects was selected using the following criteria: type of sponsorship; current funding and service delivery status; geographic distribution; recency of refunding of active grants; amount of total grant award. A team of six health professionals studies all information available in central office and the ten health professionals studies all information available in central office and the ten DHEW regional offices on these 22 projects, and made site visits to secure additional information and documentation of accomplishments wherever possible. Conditions for success or failure were identified in four major areas of HMO functional development: marketing, financing, administration, and medical organization. Success factors included having a target population of 200,000 or more; competitive benefits packages; employer/buyer representation on governing board; full-time experienced executive, marketing, and finance directors; prior existence of medical group practice in community.

PB-243 710/1GA PC$3.75/MF$2.25
General Research Corp., McLean, Va.
Evaluation of the Accomplishments of Selected HMOS-Funded Projects. Executive Summary.
Final rept.,
James S. Lubalin, John J. McCord, Ronald B. Zisk, Juliette C. Muscat, and Daniel Z. Louis. 15 Dec 74, 45p* HSA-74-10-3ES
Contract HSA-105-74-10
See also PB-243 709.

Descriptors: *Medical services, Projects, Performance evaluation, Recommendations, Financing, Marketing, Management, Health insurance.
Identifiers: *Health maintenance organizations, Health care delivery systems, *Group health plans.

Health Maintenance Organization (HMO) demonstration projects have been funded by DHEW since 1971. In anticipation of the development and implementation of regulations related to the HMO Act of 1973, an evaluation of previously funded HMO development projects was conducted. This report is the product of that evaluation. A major thrust of the investigation was to determine which factors, capable of assessment either before a project was funded by HMOS or while it was receiving funds, have been associated with clearly delineated project accomplishments. In addition to an examination of the correlates of project accomplishments within a general prospective framework, this study included a retrospective case-by-case audit of project accomplishments.

PB-243 715/0GA PC$5.75/MF$2.25
General Research Corp., McLean, Va.
Analysis of Barriers to Successful HMO Development.
Final rept.,
James Lubalin, Susan Schechter, Steven Kornish, Eugene Waller, and Robert Thibodeau. 20 Mar 75, 127p* HSA-74-10-13
Contract HSA-105-74-10

Descriptors: *Medical services, Reviews, Health insurance, Recommendations, Performance evaluation, Surveys, Costs, Questionnaires.
Identifiers: Health care delivery systems, *Health maintenance organizations, *Group health plans.

The document consists of an analysis of the barriers to implementing HSA's Health Maintenance Organization (HMO) Program. The document includes four chapters and four appendixes: I. Introduction; II. Methodology; III. Results; IV. Conclusions and Recommendations; and, Appendixes. The Introduction describes the background and purpose of the study, the study objectives, and the literature reviews performed for the study. The methodology chapter describes four distinct data collection activities. Types of data collected include comments on HMO regulations; nonapplicant feedback; a limited number of interviews; and an application rejection review. The major finding contained in the Results chapter is that cost competitive factors represent the major barriers to HMO development. The Conclusions and Recommendations section contains key suggestions for modifying the HMO statutes and for program administration.

PB-243 716/8GA PC$4.75/MF$2.25
General Research Corp., McLean, Va.
Potential Impact of the Health Maintenance Organization Act of 1973 on the Development of Rural HMOs. Volume I. Introduction, Analyses, and Suggested Program Changes.
Final rept.,
Jacqueline A. Cattani, Sue Drymalski, Al D. Flegar, James J. McCord, and Juliette G. Muscat. 21 Apr 75, 95p* HSA-74-10-13-Vol-1
Contract HSA-105-74-10
See also Volume 2, PB-243 717.

Descriptors: *Medical services, Rural areas, Tables(Data), Impact, Recommendations, Regulations, Legislation, Management, Financing, Health insurance.
Identifiers: *Health maintenance organizations, Health care delivery systems, *Group health plans.

The study describes rural HMOs, suggests how PL 93-222 might affect the development of rural HMOs and makes recommendations concerning the funding of rural HMOs. The study contains two volumes: (1) Analysis and Recommendations and (2) Field Visit Documentation. Operational data from 17 rural HMOs was analyzed with respect to functional characteristics, such as organizational structure, benefits package, marketing, etc. The study suggests that rural HMOs restructure existing resources rather than create additional capacity. The study also indicates that PL 93-222 will not necessarily foster the growth of HMOs in rural medically underserved areas. In fact, the legislation and accompanying regulations may create delivery systems that are non-competitively priced in comparison to existing indemnity plans. In short the study cautions against unrealistic expectations concerning the number and type of rural HMOs that will result from current HMO legislation.

PB-243 717/6GA PC$6.25/MF$2.25
General Research Corp., McLean, Va.
Potential Impact of the Health Maintenance Organization Act of 1973 on the Development of Rural HMOs. Volume II. Site Visit Reports and Interview Guide.
Final rept.,
Jacqueline A. Cattani, Sue Drymalski, Al D. Felgar, James J. McCord, and Juliette G. Muscat. 21 Apr 75, 157p* HSA-74-10-13-Vol-2
Contract HSA-105-74-10
See also Volume 1, PB-243 716.

Descriptors: *Medical services, Rural areas, Interviews, Surveys, Recommendations, Questionnaires, Evaluation, Impact, Health insurance.
Identifiers: *Health maintenance organizations, Health care delivery systems, *Group health plans.

The volume contains the detailed site visit reports which constituted the basis for the analyses contained in Volume I. The study universe consisted of seventeen rural HMOs in various stages of feasibility determination, planning and development, and operation under various forms of sponsorship. The major sponsorship categories represented ranged from total provider controlled to consumer dominated plans and included the open panel foundation (or Individual Practice Association), closed panel clinic/medical group, hospital, insurance, university, community, and consumer models. The concluding section of this volume contains the recommended interview guide used by the interviewers during their nine site visits and which also constituted the formal in which the prior site visited reports were restructured.

PB-243 734/1GA PC$3.25/MF$2.25
Macro Systems, Inc., Silver Spring, Md.
Initial Manpower Management Program (MMP). Executive Summary. Zero-Base Summary and Organizational Analysis, Volume I.
Manpower analysis rept.,
Richard Steele. 1974, 25p* HSA-74-6-11ES
Contract HSA-105-74-6
See also PB-243 735.

Descriptors: *Medical personnel, Personnel management, Manpower utilization, Productivity, Shortages, Tables(Data), Surveys, Analyzing, Management analysis.
Identifiers: *Health manpower, Community health services.

The document presents the 1974 Manpower Zero Base Analysis of the Health Services Administration (HSA) PHS/DHEW. As part of the overall Manpower Management Program of HSA, approximately 88% of the positions were analyzed through work measurement techniques or manpower survey methodolo-

gies. Staffing levels, budgets and organizational efforts were analyzed. Staffing shortages and overages were identified within HSA. Staffing standards, workload definitions and summary tables are presented for each Bureau and for the entire HSA. Conclusions for meeting staffing problems are presented.

PB-243 735/8GA PC$12.50/MF$2.25
Macro Systems, Inc., Silver Spring, Md.
Initial Manpower Management Program (MMP).
Manpower analysis rept.,
Richard Steel. 1974, 549p* HSA-74-6-11
Contract HSA-105-74-6
See also PB-243 734.

Descriptors: *Medical personnel, *Medical services, Manpower utilization, Tables(Data), Personnel management, Productivity, Shortages, Surveys, Analyzing, Quality assurance.
Identifiers: Health Services Administration, *Health manpower, American Indians, Community health services.

The document presents the 1974 Manpower Zero Base Analysis of the Health Services Administration (HSA) PHS/DHEW. The document consists of four sections covering the Bureau of Quality Assurance, Medical Services and Community Health Services and the Indian Health Service as well as the HSA Office of the Administrator. As part of the overall Manpower Management Program of HSA, approximately 88% of the positions were analyzed through work measurement techniques or manpower survey methodologies. Staffing levels, budgets and organizational efforts were analyzed. Staffing shortages and overages were identified within HSA. Staffing standards, workload definitions and summary tables are presented for each Bureau and for the entire HSA. Bibliographies and sources are presented in section III and IV for the direct health operations. Conclusions for meeting staffing problems are presented.

PB-243 741/6GA PC$4.75/MF$2.25
Tufts Univ., Boston, Mass. School of Medicine.
Allied Health Geographic Mobility Study, a Pilot Study.
Final rept. 1 Mar 72-30 Jun 73.
30 Jun 73, 80p HRA/OC-76020
Grant PHS-71-4024

Descriptors: *Medical personnel, Mobility, Training programs, Education, Recommendations, New York, Feasibility, Distribution(Property), Employment, Tables(Data), Questionnaires.
Identifiers: *Allied health personnel.

The report addresses the results of a feasibility study to determine a methodology for identifying patterns of geographic and occupational mobility of graduates of selected health educational programs in New York State. The study revealed that New York State allied health personnel generally are not mobile geographically and do not move from job-to-job frequently. Other areas addressed are training, attrition and work experience.

PB-243 742/4GA PC$3.25/MF$2.25
American Public Health Association, New York. Professional Examination Service.
A Project to Delineate the Role and Functions of Physical Therapy Support Personnel and to Prepare a Test and Testing Procedure for Physical Therapy Assistants.
Final rept. 25 Jun 69-31 Jan 71.
31 Jan 71, 20p HRA/OC-76/026
Contract PHS-70-4052

Descriptors: *Medical personnel, *Physical therapy, Job analysis, Manpower, Paramedical sciences, Tests, Examinations, Tables(Data).
Identifiers: *Allied health personnel.

The report reflects the methodology, approach and results of a study to delineate the role and function of support personnel in physical therapy. The report presents the appropriate functions and a sample job description for such personnel. The test development scheme is discussed and the item classification scheme is presented.

PB-243 747/3GA PC$5.25/MF$2.25
Washington Univ., Seattle. Dept. of Rehabilitation Medicine.
Review of Evidence for Indications, Techniques of Application, Contraindications, Hazards, and Clinical Effectiveness for Short-wave Diathermy.
Final rept. 1 Jan-31 Dec 74,
Justus F. Lehmann, Arthur W. Guy, Jerry B. Stonebridge, and C. Gerald Warren. 31 Dec 74, 113p FDA/HFK-75/1
Contract FDA-74-32

Descriptors: *Diathermy, Therapy, Electromagnetic radiation, Physiological effects, Biophysics, Dosimetry, Reviews, Radiation hazards, Clinical medicine, Bioinstrumentation, Performance standards.

Presented is a review of literature dealing with (short-wave) diathermy with the object of updating the indications, conditions, purposes and uses which reflect the general consensus of informed medical opinion for the proper use, as an adjunctive treatment in certain pathological conditions. Biophysics, propagation and absorption in tissue, physiological responses, clinical use, dosimetry, contraindications and potential hazards are discussed. Areas are identified that require further research and the development of performance standards for the equipment. Pulsed application is discussed. A list of references is furnished.

PB-243 781/2GA PC$4.25/MF$2.25
Macro Systems, Inc., Silver Spring, Md.
Guidelines for Patient Record-Keeping Systems for Emergency Medical Service. Volume 1,
H. Birch. 26 Sep 74, 58p HSA-74-6-7/12/17-Vol-1
Contract HSA-105-74-6
See also Volume 2, PB-243 782.

Descriptors: *Medical services, *Medical records, Records management, Instructions, Tables(Data), Patients, Reviews, Standards, Consumers, Mortality, Morbidity.
Identifiers: *Emergency medical services, Biomedical information systems, *Management information systems, Health care delivery systems.

Volume I of the handbook includes four major sections: An introduction which outlines the purpose of the manual, the need for record-keeping standards, the current state of the art with respect to EMS patient record-keeping systems, and the HSA interpretation of the record-keeping provision of the Act; a description of the management information needs of local EMS program managers and the national program; a summary of the analysis steps conducted in the development of the handbook; a presentation of the finalized minimum data set.

PB-243 782/0GA PC$5.25/MF$2.25
Macro Systems, Inc., Silver Spring, Md.
Guidelines for Patient Record-Keeping Systems for Emergency Medical Service. Volume II. Model System Guidelines for Patient Record-Keeping and Management Reporting,
H. Birch. 26 Sep 74, 124p HSA-74-6-7/12/17-Vol-2
Contract HSA-105-74-6
See also Volume 1, PB-243 781.

Descriptors: *Medical services, *Medical records, Records management, Models, Instructions, Information systems, Patients, Design, Data processing.
Identifiers: *Emergency medical services, Biomedical information systems, Management information systems, *Health care delivery systems.

The purpose of this volume is to illustrate how the Minimum Data Set (MDS) can be configured into a model reporting system for internal management utilization. However, it must be emphasized that the materials presented within this volume are not intended to provide a 'cookbook approach' to the implementation of a patient record-keeping system. The material is intended to be an illustrative guideline for use by EMS System organizations in the implementation of a patient record-keeping system, which would be tailored to their specific operational environment.

PB-243 797/8GA PC$3.75/MF$2.25
Emory Univ., Atlanta, Ga.
Three-University Study of Manpower in Anesthesia.
Final rept. 30 Jun 69-30 Sep 71,
J. S. Gravenstein, J. E. Steinhaus, and P. P. Volpitto. 1975, 39p HRA/OC-76/017
Contracts PHS-70-4033, PH-108-68-38
Prepared in cooperation with Case Western Reserve Univ., Cleveland, Ohio. Dept. of Anesthesiology.

Descriptors: *Medical personnel, *Anesthesiology, Manpower utilization, Education, Reviews, Recommendations, Tables(Data), Medical equipment, Monitors.
Identifiers: *Allied health personnel, *Health manpower.

The report reflects the results of a study of anesthesiology with special reference to manpower problems and the development of new types of allied health personnel. The report addresses the duties, functions and responsibilities of anesthesia personnel as well as the organization of the anesthesia teams. Consideration is also given to the curriculum for various members of the anesthesia team.

PB-243 798/6GA PC$4.25/MF$2.25
National Committee for Careers in Medical Technology, Bethesda, Md.
Reports on Retraining Medical Technologists.
Special rept.
May 67, 60p HRA/OC-76018
Contract PH-108-66-151

Descriptors: *Medical personnel, Medical laboratories, Manpower, Recommendations, Evaluation, Education, Effectiveness, Training programs, Standards, Instructors, Instructions.
Identifiers: Retraining, *Medical technologists, Health manpower, Curricula, Allied health personnel.

The report is a guide for curriculum content to be utilized by instructors of medical technology. The guide presents suggested content of retraining programs in twelve sections of medical technology. In addition a discussion of use in teaching adults is also presented.

PB-243 799/4GA PC$4.25/MF$2.25
Florida Technological Univ., Orlando.
Feasibility of Retraining Displaced Aerospace Personnel into the Allied and Public Health Occupations.
Final rept. 1 Jan 72-31 May 73,
Klaus W. Lindenberg. Jun 73, 52p HRA/OC-76/021
Contract PHS-72-4059

Descriptors: *Medical personnel, Public health, Education, Training programs, Florida, Ta-

bles(Data), Manpower, Statistical data, Recommendations, Questionnaires, Aerospace industry.
Identifiers: *Allied health personnel, Retraining, *Health manpower.

The purpose of the contract was to establish the feasibility of channeling some of the manpower released by the aerospace industry, Cape Kennedy, Florida into the health industry. By identifying this manpower pool in terms of basic capabilities, possibly, some personnel could be retrained for employment in the allied and public health fields. The contractor's final report presents a discussion of the findings of the study conducted which concluded that while a 4 to 5% vacancy rate for allied and public health manpower did exist in the State of Florida, such a vacancy rate 'may not necessarily reflect a manpower shortage'.

PB-243 800/0GA PC$3.25/MF$2.25
Bureau of Health Resources Development, Bethesda, Md. Div. of Dentistry.
List of Suggested Subjects for Research in Dental Economics. A Product of the National Dental Economics Research Conference (1st) Held at Atlanta, Georgia on 26-28 February 1974.
Final rept.,
William E. Spencer, Frank M. Holz, and B. Jerald McClendon. Jun 75, 18p HRA/OC-76/022

Descriptors: *Dental services, *Meetings, *Dental personnel, Health insurance, Economics, Simulation, Models, Cost effectiveness, Evaluation, Requirements, Manpower utilization.
Identifiers: *Medical economics, National Health Insurance.

The First National Dental Economics Research Conference was held in Atlanta, Georgia, 26-28 February 1974. Participants evaluated the present state of health economics research as applied to dentistry and discussed the serious need for more such research. A condensed report is given on the agenda of the Conference. At the close of the Conference participants submitted their suggestions for specific areas or subjects for dental economics research. Staff members of the Division of Dentistry, Health Resources Administration, categorized, analyzed, and consolidated the suggestions and prepared a composite list of suggested subjects for research in dental economics, which is the principal item of this document. Some representative subjects recommended for research are: nature of the demand for and supply of dental care, elasticity of demand, market effects of national health insurance, subsidization of dental care, adequacy or shortage of dental manpower, utilization of auxiliary personnel, and dental-practice simulation models.

PB-243 801/8GA PC$3.25/MF$2.25
American Occupational Therapy Association, Inc., Rockville, Md.
A Curriculum Guide for Occupational Therapy Educators.
Final rept. 15 Jun 72-28 Jun 74,
Gail S. Fidler. 20 Nov 74, 9p HRA/OC-76023
Contract N01-AH-24172

Descriptors: *Occupational therapy, *Medical personnel, Instructors, Recreation, Education, Training programs, Instructions, Manpower, Evaluation, Methodology.
Identifiers: Curricula, Allied health personnel, Health manpower.

The report recounts the approach, summary of work and the accomplishments of the project for development of a curriculum guide for occupational therapy educators. The report is a companion to a three-volume report on the delineation of the roles and functions of occupational therapy personnel and the curriculum guide itself.

PB-243 803/4GA PC$4.75/MF$2.25
American Public Health Association, New York. Professional Examination Service.
Delineation - The Physical Therapy Assistant: A Report of the Advisory Body for the Project on Physical Therapy Support Personnel. Attachment I.
Final rept. 25 Jun 69-31 Jan 71.
Jan 71, 79p HRA/OC-76027
Contract PHS-70-4052

Descriptors: *Medical personnel, *Physical therapy, Education, Regulations, Utilization, Tables(Data), Training programs, Tests, Job analysis, Standards, Legislation, Policies.
Identifiers: *Allied health manpower, Health manpower.

The report consists of eight appendices: (A) Model job description for physical therapy assistants; (B) a policy statement on their training and utilization; (C) a similar policy statement for the physical therapy aide; (D) knowledges and skills needed by physical therapy assistants; (E) supervisory relationships; (F) a model physical therapy act; (G) standards and curriculum guidelines and (H) bibliography.

PB-243 807/5GA PC$5.25/MF$2.25
Kentucky Univ., Lexington. Wenner-Gren Research Lab.
Study of Heart Synchronous Whole Body Acceleration for Circulatory Assist.
Contract rept. 15 May 73-12 Nov 74,
C. F. Knapp, E. P. McCutcheon, A. Bhattacharya, and J. M. Evans. Nov 74, 123p
NIH/NHLI-N01-HT-3-2928-1
Contract N01-HT-3-2928

Descriptors: *Cardiovascular diseases, *Myocardial infarction, *Acceleration stress(Physiology), Therapy, Vibration, Blood pressure, Blood circulation, Dogs, In vivo analysis.

Cardiovascular responses of awake, chronically instrumented canines exposed to whole body acceleration (vibration) were investigated. Both normal and myocardially ischemic subjects were studied. Conclusions were that: (1) cardiovascular responses could be 'dialed in' and maintained by proper synchronization, (2) force waveforms applied to the ischemic preparation produced greater cardiovascular effects, (3) the greater modification to cardiac function was produced by a heart synchronous asymmetrical, headward displacement waveform, increasing aortic diastolic pressure by 42% and cardiac work by 66%, and (4) the heart synchronous whole body acceleration technique of this study produced greater cardiovascular modification than did standard invasive cardiac assistance techniques, such as IABP and ECP.

PB-243 808/3GA PC$10.00/MF$2.25
Transactions Systems, Inc., Atlanta, Ga.
Assessment of Emergency Medical Systems Adequacy.
Final evaluation rept.,
Richard Leatherwood. 30 Sep 74, 374p* HSA-74-9-3/8-App
Contract HSA-105-74-9
See also PB-243 112.

Descriptors: *Medical services, Tables(Data), Assessments, Maps, Ambulances, Demography, Medical personnel, Mathematical models, Telecommunication, Systems analysis, Resources.
Identifiers: *Emergency medical services, Health resources, Health care delivery systems, Allied health personnel.

The study reports on the adequacy of emergency medical services resources (ambulances, personnel, emergency departments, communication systems) by planning district within States, by HEW Region and nationally. It also reports on the adequacy of private emergency medical services systems, using a model to assess system adequacy. The results are presented in tabular form and narratively. The appendix provides a delineation of EMS service area identification, EMS resources by health planning district, and demographic data.

PB-243 816/6GA PC$10.00/MF$2.25
President's Biomedical Research Panel, Washington, D.C.
President's Biomedical Research Panel. Transcript of the Meeting Proceedings (1st) Held at Washington, D.C. on February 24-25, 1975.
1975, 358p PBRP/75-1

Descriptors: *Meetings, Law(Jurisprudence), Research, Biology, Medicine.
Identifiers: *Biomedicine, *Medical research, Public Law 93-352.

Verbatim transcripts of the 1st Panel meeting proceedings, Monday February 24 and Tuesday February 25, this volume covers discussion on the legislative mandate establishing the Panel as outlined in Public Law 93-352. There was other discussion of Public Laws pertaining to the work of the Panel.

PB-243 822/4GA PC$4.25/MF$2.25
Macro Systems, Inc., Silver Spring, Md.
Development of a Minimum Data Set for Emergency Medical Services Patient Record Keeping.
Final rept.,
Richard Steele. 9 Jul 74, 72p HSA-74-6-7
Contract HSA-105-74-6

Descriptors: *Medical records, *Medical services, Patients, Information systems, Tables(Data), Methodology, Records management.
Identifiers: *Biomedical information systems, *Emergency medical services.

The report presents the results of a federal initiative to upgrade Emergency Medical Service Systems (EMSSs) in the United States. The report emphasizes the section of the Emergency Medical Service Systems Act of 1973 that requires a standardized patient record keeping system. HSA determined that the requirements of the law could be met by instructing each EMSS Grantee to collect a specified and limited list of data items. The report discusses the approach and methodology of a minimum EMS data set. The actual procedural handbook is found in NTIS as HSA report number HSA-74-6-7/12/17, two volumes.

PB-243 918/0GA PC$9.50/MF$2.25
President's Biomedical Research Panel, Washington, D.C.
President's Biomedical Research Panel. Transcript of the Meeting Proceedings (5th) Held at Washington, D.C. on June 30-Jul 1, 1975.
1975, 346p PBRP/76-1
See also PB-243 919.

Descriptors: *Meetings, Research, Biology, Medicine, Budgeting, Federal budgets, Financial management.
Identifiers: *Biomedicine, *Medical research.

Verbatim transcripts of the 5th Panel meeting proceedings held on June 30 and July 1, this volume contains discussion with invited witnesses representing those who participate in the budget process.

PB-243 939/6GA PC$4.75/MF$2.25
Alabama Univ., Birmingham.
Preparation and Clinical Trials of Intravenous Gamma Globulin.
Annual rept.,
Ahmed F. S. A. Habeeb, and Robert D. Francis.
2 Jun 75, 80p NIH/NHLI-N01-HB-3-2939
Contract N01-HB-32939

Descriptors: *Gamma globulin, Preparation, Evaluation, Patients, Infections, Therapy, Parenteral infusions, Motor reactions, Complement(Biology).

Immune serum globulin (IgG) has been shown to be useful in antibiotic resistant infections and it reduces the incidence of severe bacterial infections in agammaglobulinemic patients. However, the risk of severe vasomotor reactions has limited the administration of IgG via the intramuscular route. The intravenous use of IgG will be feasible if the risk is reduced without any reduction of efficacy. The vasomotor reactions have been attributed to the anti-complementary activity of IgG due to its aggregation. Moreover reduction in biological efficacy of IgG has been due to fragmentation of the molecule during storage into Fab- and Fc- like pieces by traces of plasmin. In order to provide a preparation of IgG suitable for intravenous injection, new procedures were developed. IgG was prepared by combination of Cohn fractionation and DEAE-cellulose chromatography. IgG prepared had low anticomplement activity and was suitable in storage at 4C but degradation occurred in storage at 36.5C. Antibody activity was recovered.

PB-243 978/4GA PC$3.75/MF$2.25
National Medical Association Foundation, Washington, D.C.
Characteristics of Black Physicians in the United States: Findings from a Survey.
Final rept.
28 Feb 75, 32p HRA/OC-76/030
Contract N01-MI-04120

Descriptors: *Medical personnel, *Physicians, *Negroes, Surveys, United States, Statistical data, Sex, Education, Distribution(Property), Income.
Identifiers: Health manpower.

The results of a 1972 survey of Black physicians in the United States are reported. The response rate to a mailed questionnaire was low (about 60 percent). Highlights from the survey include: Four out of five respondents were graduated from Howard or Meharry. About nine percent were females and their median age was 43.8 years, 4.6 years less than for male respondents. Black physicians respondents were concentrated in California, New York, and Washington, D.C. The most frequently reported specialties were internal medicine and obstetrics/gynecology. A majority of the respondents were in patient care, primarily in solo, office-based practice.

PB-243 980/0GA PC$3.25/MF$2.25
Albany Medical Coll., N.Y. Dept. of Pathology.
Development of Models of Coronary and Aortic Atherosclerosis in Minipigs.
Final rept. 14 Nov 73-13 Aug 74,
K. T. Lee. 10 Jul 75, 25p NIH-69-2050-3
Contract PHS-69-2050
See also report dated 15 May 73, PB-221 192.

Descriptors: *Arteriosclerosis, *Coronary artery disease, *Pathology, Swine, Laboratory animals, Experimental data, Cardiovascular diseases, Heart diseases, Research, Diet, Cholesterol, Fats, Bioinstrumentation.
Identifiers: *Animal models.

The objective of this program is to develop 'models' of human atherosclerosis in miniature swine that would be suitable for invasive and non-invasive instrumentation for the diagnosis and evaluation of the atherosclerotic conditions of various vessels. Atherosclerotic lesions have been developed in the carotid and femoral arteries in miniature swine and also in the abdominal aorta and coronary arteries by means of intimal abrasions by ballooning and atherogenic diet. This technique resulted in a rapid growth of moderate to advanced atherosclerotic lesions in these swine. The two procedures, ballooning and atherogenic diet, appear to act synergistically.

PB-244 054/3GA PC$4.25/MF$2.25
American Technical Assistance Corp., McLean, Va.
PSRO Program Cost Study,
M. Rudov, Ferd H. Mitchell, Paul S. Hughes, David Gaughen, and Susan Schechter. 30 Apr 74, 53p* HSA-74-10-1
Contract HSA-105-74-10

Descriptors: *Medical personnel, *Medical services, Evaluation, Mathematical models, Expenses, Tables(Data), Surveys, Hospitals, Cost analysis, Planning, Standards, Reviewing, Professional personnel, Patients, Projects.
Identifiers: *PSRO(Professional Standards Review Organization), *Professional Standards Review Organization, Health care.

The study performed analyses of Professional Standards Review Organization (PSRO) functions, costs of these functions and costs of PSRO programs and models useful in estimating these costs. Models for concurrent review (CR) on a per admission basis are presented, as well as the in-hospital personnel costs of medical care evaluation (MCE). Work was initiated in February and completed in April. The 203 PSRO areas were classified into seven types according to degree of urbanization and volume of Social Security Act beneficiaries. The range of estimates was $90 million to $240 million for the program, $300,000 to $1,730,000 or an average PSRO from one of the seven groups. Portions of this document are not fully legible.

6F. Environmental Biology

AD-A013 667/1GA PC$3.25/MF$2.25
Georgia Univ Athens Dept of Entomology
Standardization of Field Methods for Determination of Insecticide Spray Droplet Size.
Annual rept. no. 1, 1 Jun 74-31 May 75,
Chester M. Himel, and Richard G. McDaniel. 1 Jun 75, 20p
Contract N00014-70-A-0309-0003

Descriptors: *Insecticides, *Sprays, *Drops, Measurement, Particle size, Standardization, Field conditions, Solutions(Mixtures), Aerosol generators, Volatility, Diluents, Glass fibers, Impingement, Velocity, Sizes(Dimensions).
Identifiers: Berglund-Liu aerosol generator, Isopropyl alcohol.

Monodisperse (single size) spray droplets of organic liquids were formed in a Berglund-Liu aerosol generator. Up to 50% isopropyl alcohol was required as a volatile diluent to sustain aerosol generation. Droplet impaction and spread factors on teflon and magnesium oxide slides were determined, along with study of velocity of impact up to 20 MPH. A new droplet impingement harp using 10 micron glass fibers was developed for field and research use, as a spray droplet impingement device. The impingement of aerosol droplets (air-borne size range) is a function of droplet velocity and the geometry of the impingement surface. (Author)

AD-A013 862/8GA PC$3.75/MF$2.25
Army Environmental Hygiene Agency Aberdeen Proving Ground Md
Preliminary Assessment of Relative Toxicity of Candidate Repellent Cyclohexamethylene Carbamide.
Final rept. Jan 73-Apr 75,
Stanton C. Lovre, Jr., A. H. McCreesh, and M. H. Weeks. 20 Aug 75, 35p Rept no. USAEHA-51-057-73/76

Descriptors: *Insect repellents, *Toxicity, Carbamates, Cyclic compounds, Methylenes, Irritation, Skin(Anatomy), Absorption, Excretion, Rabbits, Experimental data.

Preliminary assessment of the relative toxicity of a proposed insect repellent cyclohexamethylene carbamide, was conducted using laboratory animals. Technical grade compound produced primary irritation of the intact and abraded skin of rabbits. However, single application of a 25 percent solution in ethanol did not produce irritation. Data obtained from 21-day continuous application of 1 percent ethanol solutions to rabbit skin, and skin sensitization studies in guinea pigs failed to indicate an unusual degree of hazard associated with its use as a topical repellent. Studies of percutaneous penetration using 14C-ring labeled compound indicated that this material is readily absorbed through the skin of rabbits and almost totally excreted in the urine. Virtually all topically administered label was recovered either in urine or at the application site, indicating little hazard from cumulative deposition. (Author)

COO-3474-3 PC$4.00/MF$2.25
State Univ. of New York, Syracuse Coll. of Environmental Science and Forestry.
Cycling and Effects of exp 36 Cl Labeled DDT on Soil Invertebrates. Annual Progress Report, 1974--1975.
D. L. Dindal. 1975, 5p
Contract AT(11-1)-3474

Descriptors: (*Ddt, *Biological effects), (*Invertebrates, *Biological stress), Communities, Decomposition, Diffusion, Metabolism, Microorganisms, Soils, Terrestrial ecosystems, Uptake.

No abstract available.

EPA-660/3-74-031 PC$4.25/MF$2.25
National Environmental Research Center, Corvallis, Oreg.
Environmental Requirements of Selected Estuarine Ciliated Protozoa.
A. C. Borror. May 75, 53p

Descriptors: (*Protozoa, *Biological variability), (*Estuaries, *Ecology), Bacteria, Biological effects, Coastal waters, Distribution, Hydrogen sulfides, New hampshire, Oxygen, Ph value, Population dynamics, Salinity, Tide.

For abstract, see NSA 32 03, number 06465.

ERDA-34 PC$4.00/MF$2.25
USAEC Nevada Operations Office, Las Vegas.
Radiological Resurvey of Food, Soil, Air, and Groundwater at Bikini Atoll, 1972.
O. D. T. Lynch, Jr, T. F. McCraw, V. A. Nelson, and W. E. Moore. Feb 75, 33p

Descriptors: (*Bikini, *Radiation monitoring), (*Food, Radiation monitoring), (*Soils, Radiation monitoring), (*Surface air, Radiation monitoring), Americium 241, Antimony 125, Birds, Bismuth 207, Cesium 137, Cobalt 60, Crustaceans, Daily variations, Environment, Europium 155, Fishes, Ground water, Iron 55, Plants, Plutonium 238, Plutonium 239, Plutonium 240, Radionuclide kinetics, Radionuclide migration, Sampling, Seafood, Seawater, Sediments, Strontium 90, Tide.

For abstract, see NSA 32 03, number 06458.

NERC-LV-539-39 PC$5.45/MF$2.25
National Environmental Research Center, Las Vegas, Nev.
Environmental Monitoring Report for the Nevada Test Site and Other Test Areas Used for Underground Nuclear Detonations, January Through December 1974.
May 75, 129p

Descriptors: (*Nevada test site, *Environment), (*Gamma sources, *Radiation monitoring), (*Xenon 133, Radiation monitoring), (*Surface air, Radiation monitoring), Dose commitments, Ground water, Human populations, Internal irradiation, Milk, Nevada, Radiation doses, Radioactivity, Sampling, Surface waters.

For abstract, see NSA 32 03, number 06459.

ORO-4180-5 PC$4.25/MF$2.25
Tennessee Univ., Knoxville.
Dynamics of the Recovery of Damaged Tundra Vegetation. Annual Progress Report.
C. C. Amundsen. 11 May 75, 23p
Contract AT(40-1)-4180

Descriptors: (*Amchitka island area, *Ecology), (*Plants, *Biological recovery), Animals, Cannikin event, Data, Milrow event, Monitoring.

For abstract, see NSA 32 03, number 06461.

PATENT-3 857 678 Not available NTIS
Department of Agriculture, Washington, D.C.
Method of Determining Toxicity of Phytotoxins in Plants.
Patent,
Lowell A. Klepper. Filed 21 Feb 73, patented 31 Dec 74, 7p PAT-APPL-334 343,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Plants(Botany), *Herbicides, Tests, Measurement, Toxicity, Plant physiology.
Identifiers: PAT-CL-23-230-R, *Phytotoxins.

This invention relates to a method of determining whether or not given compositions, such as herbicides, are phytotoxic (i.e., poisonous to plants). A simple method is disclosed in which a plant's natural process of nitrate reduction is used to determine phytotoxic activity of compositions. The basic technique can measure mode and extent of action, specificity, and application levels of most phytotoxic materials.

PB-243 775/4GA PC$3.25/MF$2.25
Maryland Univ., College Park. Water Resources Research Center.
Biochemical and Nutritional Interactions Between the Oyster (Crassostrea virginica Gmelin) and Its Environment.
Technical rept.,
Mark Keeney. Jun 75, 8p TR-32 W75-10011, OWRT-B-018-MD(1)
Contract DI-14-31-0001-4090

Descriptors: *Cadmium, *Oysters, *Metals, *Enzymes, *Metabolism, Aquatic animals, Mollusca, Water pollution, Ecology, Toxicity, Absorption(Biology), Lethal dosage, Phosphatases.
Identifiers: Water pollution effects(Animals), Crassostrea virginica.

The purpose was to obtain information on the biochemical and nutritional interactions between estuarine organisms and their environment in order to understand the effects of heavy metal uptake on these animals. A Ph.D. thesis on enzyme activity of phosphoenolpyruvate carboxykinase in the cytoplasm of the oyster has been completed. This enzyme may be involved in glycogen synthesis in the oyster. An M.S. thesis on diphosphoinositides in oyster lipid has also been completed. A study of acute toxicity levels of cadmium in water has indicated that the toxic level is between 0.1 and 0.25 ppm for oysters as measured by shell growth under laboratory conditions. A paper on phosphatases in the jellyfish has been published. Both acid phosphatases and alkaline phosphatases show similarities to vertebrate enzymes.

PB-243 825/7GA PC$13.00/MF$2.25
Syracuse Univ. Research Corp., N.Y. Life Sciences Div.
Review and Evaluation of Available Techniques for Determining Persistence and Routes of Degradation of Chemical Substances in the Environment.
Final technical rept.,
P. H. Howard, J. Saxena, P. R. Durkin, and L. T. Ou. May 75, 560p* SURC-TR-74-577
EPA/560/5-75/006
Contract EPA-68-01-2210

Descriptors: *Air pollution, *Water pollution, *Biodeterioration, *Decomposition, *Reviews, *Water analysis, Water pollution detection, Photochemical reactions, Polymers, Chemical analysis, Measurement, Metabolism, Indicator species, Gas analysis, Plastics, Sewage, Soil chemistry, Chemical reactions, Molecular structure, Absorption(Biology), Residues.
Identifiers: *Bioaccumulation.

This report reviews and evaluates the present state of techniques which have been used to determine the environmental persistence (biological, chemical and photochemical degradation) and routes of degradation of chemicals released in the environment by human activities. The techniques that were identified were reviewed and then evaluated for their ability to simulate natural environmental conditions, convenience of procedure, time requirements, necessary equipment and reproducibility. The ultimate evaluation was based on how well the methods have worked with well-known environmental contaminants. A Cost analysis of the test methods was undertaken to determine the feasibility of comprehensive screening of chemicals for environmental persistence. A relationship between chemical structure and environmental persistence is presented and some theoretical grounds for such correlations are discussed. An Attempt has been made to categorize chemicals for their suitability to various test methods based on consideration of physiochemical properties, toxicity, environmental release factors and commercial economic factors.

6H. Food

COM-75-10993/4GA PC$3.25
Oregon State Univ., Astoria. Seafoods Lab.
Effect of Precooking on Copper Content, Phenolic Content and Blueing of Canned Dungeness Crab Meat,
J. K. Babbitt, D. K. Law, and D. L. Crawford.
1975, 5p ORESU-R-75-005 NOAA-75062409
Pub. in Jnl. of Food Science, v40 p649-650 1975.

Descriptors: *Crabs, *Cookery, *Canning, Copper, Phenols, Chemical analysis, Fish harvesting, Citric acid, Seafood.
Identifiers: Reprints, Sea Grant program, Precooking, *Dungeness crabs.

The purpose of this investigation was to determine the effect of precooking Dungeness crab on the copper content, phenolic content and blueing of canned crab meat. The results indicate that precooking can greatly reduce the copper content and only slightly reduce the phenolic content of crab meat. Precooking followed by the addition of citric acid to the canned crab meat will only help to prevent blueing when the crab are in good condition and handled promptly after harvesting.

COM-75-11084/1GA PC$3.25
Washington Univ., Seattle. Inst. for Food Science and Technology.
Lipid-Protein Interaction During Aqueous Extraction of Fish Protein: Actin-Lipid Interaction,
Soliman Y. K. Shenouda, and George M. Pigott.
25 Oct 74, 12p WSG-TA-75-6 NOAA-75072219
Pub. in Jnl. of Food Science, v40 p523-532 1975.

Descriptors: *Lipids, *Fish protein concentrates, Extraction, Proteins, Solutions(Chemistry), Water, Complex compounds, Chemical reactions, Food processing.
Identifiers: Sea Grant program, *Actins, Reprints.

The paper presents the results of actin-lipid interaction in aqueous medium, studied by sucrose gradient centrifugation and polyacrylamide gel electrophoresis techniques. Results of the effect of transforming G-actin into F-actin, effect of room temperature, cold, heating, pH, and ionic strength on actin-polar lipid and actin-neutral lipid complex formation are presented. It was found that fish actin interacts with polar and neutral fish lipids at room or cold temperatures. Actin interacts either in monomer form or polymer forms. Any treatment which induces the transformation of G-actin into F-actin increases the lipid-actin complex formation.

COM-75-11085/8GA PC$3.25
Washington Univ., Seattle. Inst. for Food Science and Technology.
Lipid-Protein Interaction During Aqueous Extraction of Fish Protein: Fish Actin Preparation and Purification,
Soliman Y. K. Shenouda, and George M. Pigott.
25 Oct 74, 5p WSG-TA-75-7 NOAA-75072220
Pub. in Jnl. of Food Science, v40 p520-522 1975.

Descriptors: *Fish protein concentrates, *Extraction, Food processing, Purification, Proteins, Lipids.
Identifiers: *Actins, Sea Grant program, Reprints.

This paper describes the method of preparation and amino acid analysis of pure actin from fish. The procedure for actin preparation and purification consists of four steps: (1) preparation of acetone powder; (2) preparation of G-actin; (3) purification by polymerization; and (4) purified G-actin. The elution profile for the actin preparation showed a major actin band and a tropomyosin band below the G-actin. Traces of actins as faint bands at the top of the gel were also detected. Data from amino acid analysis of the purified G-actin show a close similarity in amino acid composition between rabbit and fish actin, however, it is noted that 3-methylhistidine is absent in fish actin.

COM-75-11117/9GA PC$3.25
Washington Univ., Seattle. Inst. for Food Science and Technology.
Protein Hydrolysate from Fish Waste,
W. Tarky, O. P. Agarwala, and G. M. Pigott. 4 Feb 73, 5p WSG-TA-73-31 NOAA-75072222
Pub. in Jnl. of Food Science, v38 p917-918 1973.

Descriptors: *Solid wastes, *Fish protein concentrates, *Hydrolysis, *Pepsin, Proteins, Materials recovery, Hydrolases.
Identifiers: *Fish processing, Sea Grant program, Reprints.

The purpose of this study was to develop a procedure for economical yield of highgrade protein from fish waste. It was found that fish filleting waste can be upgraded by a simple, nonsolvent process, yielding soluble, low-fat protein for supplementation of expensive proteins, and thus reducing total cost without any loss in protein efficiency. Pepsin was selected in this investigation as the enzyme owing to its low optimum pH, which controls undesirable bacterial degradation of raw material.

N75-26630/4GA PC$7.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Dept. of Nutrition and Food Science.
Mechanisms of Deterioration of Nutrients.
Annual Report, 13 Mar. 1974 - 13 Mar. 1975.
M. Karel, and J. M. Flink. 13 Mar 75, 215p NASA-CR-141866
Contract NAS9-12485

Descriptors: *Dehydrated food, *Freezing, *Taste, Nutrients, Preserving.

For abstract, STAR 1317

PATENT-3 167 202 Not available NTIS
Department of the Army Washington D C
Closure Assembly for Container Neck.
Patent,
Joseph Tolciss. Filed 15 Jan 64, patented 26 Jan 65, 3p Rept nos. PAT-APPL-337 964,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Closures, *Patents, *Containers, *Beverages, Cold weather, Configurations, Drawings.
Identifiers: PAT-CL-215-47.

The patent concerns a container for keeping beverages hot. The container includes a neck having a free outer end as well as inner and outer surfaces, a guard for the neck. The guard is formed of resilient material comprising inner and outer tubular portions connected together at one end by an integral web. The closure for the guard comprises a cap portion having a web and a skirt, a plug depending centrally from the web in concentric relation to the skirt and having a ball portion integral with the lower end thereof. There are interfitting means for releasably securing the guard on the neck comprising a series of radially and inwardly extending bosses formed on the inner surface of the outer tubular portion of the guard and a series of radially and outwardly extending recesses formed on the outer surface of the neck on the guard and disposed in complementary arrangement with the bosses.

PATENT-3 169 070 Not available NTIS
Department of the Army Washington D C
Method for Use in Freeze-Vacuum Dehydration of Meat.
Patent,
Ferdinand P. Mehrlich, and Raymond R. Haugh. Filed 5 Apr 61, patented 9 Feb 65, 4p Rept nos. PAT-APPL-101 032,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Freeze dried foods, *Meat, Dehydration, Vacuum, Freeze drying, Heaters, Control, Food processing.
Identifiers: PAT-CL-99-208.

The patent concerns a method of freeze-vacuum drying meat by: slicing unfrozen meat into thin slices prior to drying, freezing the meat while it is in a certain form and compressed condition, and then subjecting it to vacuum to freeze-dry. When the frozen and compressed meat is subjected to vacuum, at least part of the heat of sublimation of the moisture is supplied to the meat along the reverse sides of the peaks and the portions of the meats that are compressed.

PATENT-3 865 802 Not available NTIS
Department of Agriculture, Washington, D.C.
Process for Obtaining Full-Fat Oilseed-Protein Beverages Using Water and Initial Acid pH.
Patent,
Gus C. Mustakas. Filed 20 Jun 73, patented 11 Feb 75, 6p PAT-APPL-371 643,
Supersedes PB-234 152.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Oilseeds, *Proteins, *Beverages, *Soybeans, Extraction, Food processing.
Identifiers: PAT-CL-260-123-5.

A process is disclosed for preparing a full-fat protein isolate in a highly stable dispersion which is particularly suitable as a nonflatulent milk-type beverage. The yields of protein and fat in the final product are as high as 96% and 83% respectively.

6I. Hygiene and Sanitation

N75-26060/4GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Sterilization with Ethylene Oxide Gas.
K. Liebermeister. Jul 75, 13p NASA-TT-F-16412
Contract NASW-2483
Tran-Transl. Into English from Deut. Med. Wochenschr. (West Germany), V. 87, No. 11, 1962 p 552-555.

Descriptors: *Chemical sterilization, *Ethylene oxide, *Gas mixtures, Cost analysis, Dry heat, Tables (Data), Toxicity.

For abstract, STAR 1317

6J. Industrial (Occupational) Medicine

PB-243 784/6GA PC$3.25/MF$2.25
Aeronautical Research Inst. of Sweden, Stockholm.
A Method for the Measurement of Energy Absorption in the Human Hand Using Various Types of Hand Tools,
Ingmar Johnson. 1975, 21p FFA-Memo-97

Descriptors: *Energy absorption, *Vibration, *Industrial medicine, *Hand tools, Occupational diseases, Hand(Anatomy), Tissues(Biology), Measurement, Operators(Personnel), Stress(Physiology), Sweden.
Identifiers: Occupational safety and health.

A method has been developed for the measurement of vibrational energy dissipated in the human hand using certain types of hand tools, for instance, pneumatic rock drills. Dissipated energy seemed to be potentially one of the best parameters for studying the dynamic interaction between the operator's hand and the vibrating power tool as a background to research on vibrational diseases among professional workers. The method is based on measurements of vibrational force and acceleration as close as possible to the palm surface of the hand. This is obtained by using a special handle equipped with force transducers and accelerometers corresponding to each one of three orthogonal directions in space. By intergration of the acceleration signal, the corresponding instantaneous velocity is obtained. Analog multiplication of the force and velocity vectors produces a single output proportional to the energy dissipated per unit time or the dissipated power.

6K. Life Support

N75-26634/6GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
A Month Alone with Chlorella.
S. Starikovich. Jul 75, 8p NASA-TT-F-16463
Contract NASW-2481
Tran-Transl. Into English from Khimiya I Zhizn (Ussr), No. 5, 1974 p 58-63.

Descriptors: *Chlorella, *Closed ecological systems, *Human factors engineering, Carbon dioxide, Methane, Oxygen, Water treatment.

For abstract, STAR 1317

N75-26666/8GA PC$7.25/MF$2.25
Hamilton Standard, Windsor Locks, Conn.
Study and Assessment of Advanced Etc/Lss Application to Space Shuttle.
Final Report.
C. L. Beal. Apr 75, 208p NASA-CR-141872, SVHSER-6523
Contract NAS9-13964

Descriptors: *Life support systems, *Space shuttle orbiters, Heat exchangers, Spacecraft cabin atmospheres, Spacecraft sterilization, Technology assessment, Water reclamation.

For abstract, STAR 1317

N75-26667/6GA PC$6.25/MF$2.25
Southwest Research Inst., San Antonio, Tex.
A Gas Flow Indicator for Portable Life Support Systems.
Final Technical Report.
R. L. Bass, Iii, and E. C. Schroeder. May 75, 164p NASA-CR-141892
Contracts NAS9-13575, SWRI PROJ. 02-3713

Descriptors: *Gas flow, *Portable life support systems, *Ventilation, Apollo project, Breadboard models, Performance tests, Pressure sensors, Product development.

For abstract, STAR 1317

6L. Medical and Hospital Equipment

PAT-APPL-571 307/GA PC$3.25/MF$2.25
Department of Health, Education, and Welfare, Washington, D.C.
Texturing of Polymeric Surfaces of Implant Devices for Tissue Ingrowth.
Patent Application,
Filed 24 Apr 75, 9p DHEW-AID-4-74
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Polymers, *Patent applications, *Mechanical organs, *Prosthetic devices, Materials, Implantation, Tissues(Biology), Compatibility, Surface finishing, Texturing.
Identifiers: *Biomaterials, Tissue compatible materials.

Polymeric surfaces forming the exterior surface of artificial implant devices adapted to be implanted in the bodies of living creatures such as human beings, are integrally textured to promote ingrowth of body tissue in intimate contact therewith. The patent application discloses a method for texturing which is effected by sandpapering the polymeric surface so as to form a network of minute irregularly projecting and intersecting burrs of the polymeric material defining between them a series of minute irregularly shaped interstices. When artificial implant devices having their exterior surfaces formed of such textured polymeric material are implanted in a human body, the body tissue in intimate contact with the textured surface grows around the burrs and into the interstices, thereby firmly anchoring the device in place by tissue ingrowth.

PAT-APPL-576 581/GA PC$3.25/MF$2.25
Department of Health, Education, and Welfare, Washington, D.C.
Gas Flow Monitor for Anesthetic Machines.
Patent Application,
J. Sculock. Filed 12 May 75, 13p DHEW-G-70-74
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Anesthesiology, *Medical equipment, Monitors, Gas flow, Oxygen.

The patent application discloses a gas flow monitor for an anesthetic machine which will alert the operator in the event of either a fall in oxygen pressure or any other event leading to an inadequate oxygen flow while other gases are being supplied. The monitor comprises a fluidic OR/NOR logic gate which receives a gaseous anesthetic under pressure as its power stream input. A respiratory gas such as oxygen, is fed to one control stream of the gate and, when an adequate flow thereof exists, a mixture of oxygen and gaseous anesthetic flows through the OR outlet port and is supplied to the breathing circuit. If an insufficient diverting flow of oxygen is present in the control stream, the gaseous anesthetic will be switched by the fluidic gate to flow through the NOR outlet which is connected to activate a pressure electric switch to sound an alarm. Portions of this document are not fully legible.

PB-243 269/8GA PC$3.75/MF$2.25
New York Univ., N.Y. Prosthetics and Orthotics.
Studies of Spinal Orthoses and Below-Knee Prostheses.
Final rept.,
Norman Berger, Sidney Fishman, and Leon Bennett. May 71, 31p SRS-23-55057-001
Grants SRS-23-55057, SRS-RD-3348-MPO

Descriptors: *Prosthetic devices, Medical equipment, Artificial limbs, Vertebrae, Design, Fitting.
Identifiers: *Orthoses.

The pilot project for design of measurement techniques and clarification of research approaches focused on: (1) spinal orthotics and (2) lower extremity prosthetic alignment. The project developed a number of measurement procedures for which feasibility was established. Data collected by means of the measures provide a more scientific base for relating brace function: prescription criteria and fitting principles.

PB-243 490/0GA PC$5.25/MF$2.25
IIT Research Inst., Chicago, Ill.
Test and Evaluation of Medical Devices.
Annual rept. Jan 73-Aug 74,
E. E. Brueschke, E. F. Uretz, and G. Hauser. Mar 75, 115p IITRI-M6254-A1 NIH/NHLI-N01-HT-9-2125-3
Contract N01-HT-9-2125
See also PB-231 996.

Descriptors: *Medical equipment, *Mechanical organs, *Mechanical hearts, Radioisotope batteries, Evaluation, Tests, Experimental data, Dogs, In vitro analysis, Design, In vivo analysis, Laboratory animals, Heart, Implants, Transformers, Bovines.
Identifiers: Cardiac assist devices, *Cardiac pacemakers, *Blood pumps.

Activities during the reporting period include test and evaluation of nuclear powered pacemakers; test, evaluation, and design of transcutaneous transformers to supply power for implanted blood pumps; and two exploratory projects aimed toward developing pulsatile coronary perfusion pumps and a circulation supporting periaortic pump. The nuclear powered pacemaker evaluation is designed to characterize the operating characteristic of such pacemakers over their anticipated five or more years of useful life. More than thirty pacemakers are implanted in dogs and six are being subjected to high stress bench tests. The transformer activities were initially to evaluate a transcutaneous transformer system developed by Stanford Research Institute using in vivo calf experiments, but later shifted from test and evaluation to development of a new transformer design. The hinged aortic pump was designed to be positioned around the descending thoracic aorta to provide prolonged circulatory support following cardiac surgery. A prototype pulsatile coronary perfusion pump was constructed and used in seven acute in vivo experiments.

PB-243 713/5GA PC$3.75/MF$2.25
Utah Univ., Salt Lake City. Inst. for Biomedical Engineering.
Wearable/Portable Artificial Kidney: A Feasibility Study.
Annual rept. 12 Dec 73-11 Dec 74,
W. J. Kolff, J. D. Andrade, and D.L. Coleman. 1 Oct 74, 27p AK-1-74-2200

Descriptors: *Artificial kidneys, Feasibility, Mechanical organs, Dialyzers, Blood, Peritoneum, Portable equipment, Urea, Phosphates, Kidney failure, Liver diseases, Toxic diseases, Therapy, Uremia.
Identifiers: Hemodialysis, Peritoneal dialysis.

Research completed and on going during the present contract year indicates the practical feasibility of a portable/wearable artificial kidney (PWAK) based on a small dialyzer and miniature ultrafiltrate (dialysate) regeneration system. The final system should be useful for the treatment of chronic uremia by either hemodialysis or peritoneal dialysis and for the treatment of acute hepatic failure and many types of acute chemical intoxications. The mass balance study indicates all of the standard 'toxins' can be handled with the exception of urea and phosphate. The latter is dependent on a new high capacity binder. Miniature urea removal systems are under development. Both urea and phosphate removal in a low volume system appear feasible.

PB-243 753/1GA PC$5.25/MF$2.25
Jet Propulsion Lab., Pasadena, Calif.
Effects of the Physiological Environment on the Long-Term Physical Performance of Polymeric Materials.
Annual rept. Dec 73-Nov 74,
J. Moacanin, R. F. Fedors, J. D. Ingham, E. F. Cuddihy, and S. Chan. 28 Apr 75, 105p JPL-1200-242
See also PB-232 641.

Descriptors: *Urethanes, *Elastomers, *Mechanical organs, *Prosthetic devices, Gels, Mechanical hearts, Mechanical properties, Medical equipment, Implantation, Stability, Durability, Tensile strength.
Identifiers: *Biomaterials, *Blood compatible materials.

Studies were made on dynamic fatigue in air and in saline solution of a segmented polyether methane elastomer used as a flexible substrate for implantable devices. Causes for potential problem areas such as creep or solvent stress cracking were identified and related to morphology factors. The effects of adventitious products on properties was also assessed. A rotating disc device was constructed and its fluid flow characteristics enlarged. This device will be used to study the erosion of blood-compatible coatings under flow conditions. Structure of water in hydrogel was studied using nuclear magnetic resonance.

PB-243 772/1GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge.
Crosslinked Collagen-Glycosaminoglycan Composite Materials: Biological and Mechanical Properties.
Annual rept. no. 1, 1 Jul 74-30 Jun 75,
I. V. Yannas. Jul 75, 41p NIH/NHLI-N01-HB-4-2969-1
Contract N01-HB-4-2969

Descriptors: *Collagens, *Anticoagulants, Blood coagulation, Heparins, Composite materials.
Identifiers: *Mucopolysaccharides, *Blood compatible materials, Biomaterials, Hyaluronic acid, Chondroitin sulfate.

During the first year of the contract period several crosslinked collagen-glycosaminoglycan (GAG) composite materials were prepared, characterized and tested hematologically as well as mechanically. It was found that reaction of collagen with chondroitin 6-sulfate strongly suppresses the procoagulant and platelet aggregating activities of the former while reaction of collagen with hyaluronic acid is less effective in this respect. This study suggests that the heparinization of various polymeric surfaces as a method for preparing nonthrombogenic materials can be advantageously replaced by treatment of such surfaces with a sulfated glycosaminoglycan, such as chondroitin 6-sulfate, which possesses no significant anticoagulant activity.

PB-243 809/1GA PC$5.25/MF$2.25
Thermo Electron Corp., Waltham, Mass.
Study of the Effects of Additional Endogenous Heat.
Annual technical progress rept. 13 Sep 73-13 Sep 74,
F. N. Huffman, J. C. Norman, and K. G. Hagen. Sep 74, 113p TE4064-32-75 PH-43-66-982-R
Contracts N01-HV-6-982, PH-43-66-982
See also PB-235 246.

Descriptors: *Mechanical hearts, *Heat tolerance, *Radiation tolerance, Engines, Thermal radiation, Nuclear radiation, Radioisotope heat sources, Body temperature, Heat shielding, Heat sinks, Dogs, Primates, Laboratory animals, In vivo analysis.
Identifiers: *Cardiac assist devices.

The feasibility of fully implantable circulatory support systems depends on the ability of the body to dissipate heat from the power source driving the blood pump. If the energy source is a radioisotope, the body must also tolerate chronic intracorporeal radiation. The objective of the endogenous heat program is to characterize the effects and management of the added thermal load and nuclear radiation on mammals. This program is a continuation of initial canine studies using electrical heat exchangers and subsequent efforts utilizing 16- and 24-watt plutonium-238 heat sources. The effects of radiation equivalent sources in canines and primates have been under study for several years. The possibility of rejecting heat through the bladder of an axisymmetric blood pump has been evaluated. On the basis of the negative

findings of this work, effort has recently been diverted to synthesizing a pump specifically to incorporate the heat rejection function.

PB-244 087/3GA PC$3.75/MF$2.25
Abcor, Inc., Cambridge, Mass.
A Two-Stage, Heat Sterilizable Connector for Use in Processing Frozen Blood.
Annual rept. 1 Jan 73-31 Dec 74,
William W. Cooper, Charles E. Huggins, and Mark Weinberg. 31 Dec 74, 50p ABCOR-2657-A
NIH/NHLI-N01-HL-4-2927
Contract N01-HL-4-2927
Prepared in cooperation with Massachusetts General Hospital, Boston.

Descriptors: *Blood preservation, Freezing, Connectors, Instruments, Sterilization.

The objective of this work is the development of a two stage, heat sterilizable connector which will assure sterility when entering a blood bag system to add or remove agents required in processing blood for freezing. Because sterility would be assured, use of the connector could potentially extend the present 24 hour outdating period for frozen-thawed red cells. The connector being developed has male and female sections which can be joined in a first stage of union without breaking the sterile seals between the systems being united. While in this stage, the connector can be heat sterilized to remove any contamination on the mating surfaces. After sterilization the male and female sections are completely joined in the second stage of union and the sealing septa broken in the process.

6M. Microbiology:

AD-A013 696/0GA PC$3.25/MF$2.25
Naval Medical Research Unit No 3 Fpo New York 09527
Babesia Canis in an Egyptian Balady Dog: A Case Report.
Technical scientific rept.,
B. A. M. Botros, R. W. Moch, and I. S. Barsoum. 1973, 9p Rept no. NAMRU-3-TR-59-74
Availability: Pub. in Jnl. of the Egyptian Veterinary Medical Association, v33 n3-4 p171-176 Jul-Dec 73.

Descriptors: *Hemosporidia, Blood diseases, Egypt, Rabies virus, Babesia, Morphology(Biology), Disease vectors, Reprints.
Identifiers: Babesia canis, Balady dog.

A stray, male, 5-months-old, balady dog collected from Cairo, Egypt during a rabies campaign program was found to be naturally infected with a large Babesia species. Although the measurements of this parasite were somewhat larger than those previously reported for B. canis, it is believed to be the same species because of their morphological similarity. Camera lucida drawings and photomicrographs of the reported parasite are presented. (Author)

AD-A013 700/0GA PC$3.25/MF$2.25
Naval Medical Research Unit No 3 Fpo New York 09527
A Search for the Epidemic Typhus Agent in Ethiopian Ticks.
Technical scientific rept.,
W. Burgdorfer, R. A. Ormsbee, M. L. Schmidt, and H. Hoogstraal. 1973, 10p Rept no. NAMRU-3-TR-57-74
Resume in French.
Availability: Pub. in Bulletin of the World Health Organization, v48 p563-569 1973.

Descriptors: *Typhus rickettsiae, Searching, Epidemiology, Ticks, Ethiopia, Disease vectors, Serology, Reprints.
Identifiers: *Rickettsia Prowazeki, *Amblyomma ticks.

The presence of antibodies to Rickettsia prowazeki in domestic animals from several parts of Africa, and the isolation of this rickettsia from the blood of goats and sheep and from ticks off cattle or camels in Ethiopia, led to the hypothesis that R. prowazeki in nature may occur in an extrahuman cycle involving ticks and domestic animals. This study attempted to recover R. prowazeki from 2624 ticks (4 genera, 10 species) collected in central and southern Ethiopia. The ticks were examined by the haemolymph test and by the injection of tissues into guineapigs. No strains of typhus rickettsia were received and there was no serologic evidence suggesting the presence of this agent in any of the ticks examined. One Amblyomma cohaerens contained an organism that reacted specifically with fluorescing antibodies against R. prowazeki; attempts to isolate and identify this agent failed. Fifty-seven (2.2%) Amblyomma ticks (26 A. gemma, 17 A. variegatum, 14 A. cohaerens) were infected with rickettsiae of the spotted fever group, and probably represented R. conori or closely related rickettsial agents. (Author)

AD-A013 702/6GA PC$3.25/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
Biological Activity and Complementation of the Two Peptides of Staphylococcal Enterotoxin B Formed by Limited Tryptic Hydrolysis,
Leonard Spero, Joseph F. Metzger, John R. Warren, and Beverly Y. Griffin. 20 Jan 75, 7p
Availability: Pub. in The Jnl. of Biological Chemistry, v550 n13 p5026-5032, 10 Jul 75.

Descriptors: *Enterotoxins, Hydrolysis, Trypsin, Peptides, Chromatographic analysis, Antigen antibody reactions, Reprints.
Identifiers: *Staphyloccal enterotoxin B.

Tryptic hydrolysis after reduction and carboxamidomethylation of staphylococcal enterotoxin B cleaved the single susceptible bond located between the 2 half-cystines of the molecule, Lys-Thr at positions 97 and 98. The product remained as a single particle but was separated into the two constituent peptides by denaturants, and purification of the two fragments was accomplished by chromatography on CM-cellulose in 8 M urea. Antigenic activity was exhibited by the separated peptides after dialysis of urea solutions against dilute buffer, but was very labile. No emetic activity in rhesus monkeys was found for either separated peptide. (Author)

AD-A013 704/2GA PC$3.25/MF$2.25
Army Medical Research Inst of Infectious Diseases Frederick Md
Intrinsic and Chemically Produced Microheterogeneity of Staphylococcus aureus Enterotoxin Type C,
Joseph F. Metzger, Anna D. Johnson, and Leonard Spero. 13 Feb 75, 5p
Availability: Pub. in Infection and Immunity, v12 n1 p93-97 Jul 75.

Descriptors: *Enterotoxins, Heterogeneity, Cultures(Biology), Purification, Chromatography, Incubation, Separation, Classification, Reprints.
Identifiers: *Enterotoxin C, *Staphylococcus aureus.

Staphylococcus aureus enterotoxins C sub 1 (sec sub 1) and C sub 2 (sec sub 2) produced from 50-liter quantities of crude culture supernatants were purified chromatographically in a neutral or acid milieu. Microheterogeneity of sec sub 1 was markedly increased by treatment of the purified toxin with alkali, and new, more acidic charged species appeared. Sec sub 2 was more heterogenous than any of the other S. aureus enterotoxins and was affected only slightly by treatment with alkali. Prolonged incubation of the organism during production of the sec sub 2 produced changes in charged species that may be related to a bacterial deamidase, since similar changes were not seen with alkaline treatment of the purified toxin. Although sec sub 1 and sec sub 2 showed complete identity immunologically, they are separate, distinct toxins, and alkali treatment of sec sub 1 did not produce sec sub 2. (Author)

AD-A014 054/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Botulism,
I. V. Seppi. 8 May 75, 6p Rept no. FSTC-HT-23-0711-75
Trans. of Zdorove (USSR) n8 p16-17 1972.

Descriptors: *Clostridium botulinum, *Food poisoning, Toxins and antitoxins, Canned foods, Fishes, Seafood, Sterilization, Pathology, Bacteria, USSR, Translations.
Identifiers: *Botulism, Signs and symptoms.

The article describes the botulism bacilli and botulinus toxin, the conditions under which they flourish and symptoms of botulism. It emphasizes that the toxin is destroyed by heating to boiling for a few minutes, that home-canned foodstuffs and poached fish are the predominant sources of botulinus toxin and that botulism is insidious, in that it rarely changes the appearance, taste or smell of food. Most symptoms are common to other types of poisoning, particularly alcoholic. Double vision and disruption of swallowing are signs for immediately seeing a doctor.

PAT-APPL-572 991/GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Application of Luciferase Assay for Atp to Antimicrobial Drug Susceptibility Testing.
Patent Application.
E. W. Chappelle, G. L. Picciolo, M. J. Barza, L. Weinstein, and S. A. Tuttle. Filed 30 Apr 75, 29p
NASA-CASE-GSC-12039-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Adenosine triphosphate (Atp), *Antibiotics, *Bacteriology, *Bioluminescence, Bioassay, *Patent applications.

A method is described for measuring the susceptibility of bacteria to antimicrobial agents by utilizing the bioluminescent reaction between adenosine triphosphate (ATP) and luciferase-luciferin mixtures. The bacterium is cultured in a growth medium and the amount of ATP in a sample of the bacterium is determined by measuring the amount of luminescent light emitted when the bacterial ATP is reacted with a luciferase-luciferin mixture. A fresh sample of the bacterium is then subjected to an antibiotic agent and the amount of bacterial ATP is assayed after the antibiotic treatment in the same manner. The ATP index is determined from the values obtained from the assay procedures.

PAT-APPL-587 974/GA PC$3.25/MF$2.25
Department of Health, Education, and Welfare, Washington, D.C.
Temperature-Sensitive Recombinant Mutant Viruses and a Process for Producing Same.
Patent Application,
Robert M. Chanock, and Brian R. Murphy. Filed 18 Jun 75, 23p DHEW-E-162-72
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Influenza virus, *Mutations, *Viruses, *Vaccines, *Patent applications, Temperature, Fluorouracil, Sensitivity, Preparation, Viral diseases, Immunity.
Identifiers: Genetic recombination.

The patent application describes a method which produces temperature sensitive (ts) recombinants by modifying wild-type influenza A viruses. Chemically mutagenized donor viruses possessing ts lesions and shut off temperatures in the area 37-38C are utilized. Such a recombinant virus has been produced that contains the surface H3 antigen of influenza A/Hong King/1968 (H3N2) virus and a temperature-sensitive (ts) lesion derived from a ts mutant of influenza A/Great Lakes/1965 (H2N2) virus. When utilized as a vaccine, these temperature-sensitive recombinant viruses develop only mild symptoms, but the infection induces complete resistance to influenzal disease. The temperature-sensitive donor mutant is prepared chemically by growth of the virus in the presence of 5-fluorouracil (5-FU). Portions of this document are not fully legible.

PATENT-3 887 697 Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
Hemagglutination Method for Australia Antigen and Antibody Thereto.
Patent,
Girish N. Vyas, and Nahum Raphael Shulman.
Filed 9 Aug 71, patented 3 Jun 75, 4p PAT-APPL-170 292,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Hepatitis, *Hemagglutination, *Patents, Infectious hepatitis virus, Agglutination, Serology, Antigens, Antibodies, Tests, Viral diseases, Viruses.
Identifiers: PAT-CL-424-12, *Australian antigen.

The patent is a method for detecting Australia antigen or the antibody thereto in the serum of a patient with viral hepatitis or detected in other appropriate biological material by a hemagglutination assay. Indicator red cells are coated with purified hepatitis-associated-antigen and serum taken from the patient or other biological material is mixed therewith. If antibodies are present in the tested material hemagglutination will occur. In the test for the antigen the serum or other biological material is mixed with antibodies prior to contacting the mixture with the coated cells. Hemagglutination-inhibition indicates the presence of antigen in the test material.

6O. Pharmacology

AD-A013 653/1GA PC$3.75/MF$2.25
Agricultural Research Council Babraham (England) Inst of Animal Physiology
In vitro Research into the Action Mechanism of Antimalarial Drugs.
Final technical rept. Oct 73-Oct 74,
H. Laser, R. Klein, P. Kemp, N. Miller, and D. Lander. Jan 75, 34p ARDG(E)-R/D-2012
Contract DAJA37-74-C-1210

Descriptors: *Antimalarials, *Pharmacology, Quinine, Plasmodium, Parasites, Erythrocytes, Drugs, Fatty acids, Phospholipids, Enzymes, Hemolysis, Metabolites.
Identifiers: Plasmodium knowlesi.

It has been postulated that schizonticidal drugs, all of which enter the erythrocytes, do not act directly on the parasites but react with parasite produced metabolites, non-interference with which is a prerequisite for the development of the parasites. The potential metabolites involved are unsaturated fatty acids and an enzyme found to occur in parasitized(Plasmodium knowlesi) erythrocytes which has the characteristics of phospholipase C. Both metabolites are haemolytic. They do not however, destroy the parasitized erythrocytes before the end of schizogony is attained. Both inhibitions of haemolysis are counteracted by quinine and other schizonticidal drugs which, on the one hand, free the fatty acid from its binding to haemoglobin and, on the other hand, activate phospholipase C at those minimal calcium concentrations obtained inside the erythrocytes.

AD-A013 726/5GA PC$3.75/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
Alcohol and Aviation.
Aeromedical Review,
John A. Bishop. Jul 75, 28p Rept nos. SAM-Review-3-75, SAM-TR-75-17

Descriptors: *Aviation personnel, Alcohols, Reviews, Aerospace medicine, Physiological effects, Pharmacology, Chemistry, Tables(Data), Alcoholism, Drug abuse, Drug addiction, Aviation accidents, Absorption(Biological).
Identifiers: *Alcohol ingestion.

The review provides Air Force flight surgeons information regarding the more common problems of alcohol and aviation. Background, problems, chemistry, and pharmacology of alcohol are discussed. This represents one aspect of continuing education in aerospace medicine for the flight surgeon.

AD-A014 048/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Mechanisms of Amizyl (Benactyzine) and Diphacil Action on the Brain,
S. S. Krylov. 12 Mar 75, 11p Rept no. FSTC-HT-23-434-75
Unedited trans. of Farmakologiya i Toksikologiya (USSR) n5 p529-533 1972.

Descriptors: *Conditioned response, *Drugs, *Parasympatholytic agents, *Cholinergic blocking agents, Brain, Catecholamines, Nicotine, Pharmacology, Translations, USSR.
Identifiers: Benactyzine, Benzilates, Adiphenine hydrochloride.

Proof is presented that amizyl and diphacil may only block the central choline receptors, but have an effect on the presynaptic reservoirs of mediators. Amizyl releases noradrenalin from the synaptic vesicles. Diphacil stabilizes the presynaptic reservoirs of catecholamines, nicotine releases noradrenalin and, apparently, dopamine from the presynaptic reservoirs. It is proposed that the basis of action of nicotine on the brain is release of catecholamines from their presynaptic reservoirs and that central n-cholinolytics prevent this action of nicotine.

AD-A014 065/7GA PC$5.25/MF$2.25
Louisville Univ Ky School of Medicine
Correlation of Animal, Crypt, and Stem Cell Survival in Fission Neutron Irradiated Mice: A Chemical Protection Study.
Final rept. Oct 71-Dec 74,
Curtis P. Sigdestad. 1 Feb 75, 101p
Contract DADA17-72-C-2038

Descriptors: *Radioprotective agents, *Drugs, Radiobiology, X rays, Neutron irradiation, Gastrointestinal system, Hemopoietic system, Pathology, Pharmacology, Dosage.

The report surveys the effectiveness of newly synthesized antiradiation compounds (WR-2721, WR-77913, WR-638, WR-1607, WR-2347, WR-3689, WR-109342, WR-2822, and WR-2823) in comparison with the other protectors (MEA and AET). The effects of high energy x-rays (4 MeV) and fission neutrons was tested on (1) intestinal crypt survival, (2) lethality, LD50 and (3) total and per crypt cellularity.

AD-A014 069/9GA PC$4.25/MF$2.25
Oregon Graduate Center Beaverton
Synthesis of C-Nucleosides Related to Adenosine as Potential Antimalarials.
Rept. no. 6 (Final),
G. Doyle Davis, Jr. 15 Nov 74, 53p
Contract DADA17-73-C-3046
See also report dated Feb 74, AD-784 300.

Descriptors: *Antimalarials, *Nucleosides, *Adenosine, Pharmacology, Synthesis(Chemistry), Drugs, Chemical reactions.

A synthetic study of C-nucleoside analogs of adenosine for evaluation as potential antimalarials was undertaken. Strategically the synthetic route chosen because of its generality involves coupling of preformed nitrogen heterocyclic base and carbohydrate derivatives using an organometallic coupling reaction to effect the key glycosidic linkage. This synthetic sequence can be visualized as involving four discrete stages for investigation: (1) preparation of the precursor base and carbohydrate components, (2) protection of sensitive functional groups on the heterocyclic base, (3) coupling of the base and carbohydrate precursors to form a C-nucleoside and (4) elaboration of the desired base and carbohydrate substituents.

6P. Physiology

AD-A013 705/9GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
Cerebellar Inhibition of Auditory Function.
Progress rept. Oct 73-Aug 74,
James W. Wolfe, and C. M. Kos. 1974, 7p Rept no. SAM-TR-74-355
Presented at Annual Meeting of the American Academy of Ophthalmology and Otolaryngology (79th) Dallas, 6-10 Oct 74.
Availability: Pub. in Transactions American Academy of Ophthalmology and Otolaryngology, v80, pORL-314-ORL-318 May-Jun 75.

Descriptors: *Auditory acuity, Hearing, Repair, Cerebral cortex, Central nervous system, Inhibition, Pharmacology, Reprints.

These data suggest that pharmacologic depression of cerebellar function with removal of central inhibition could improve sensorineural hearing loss. (Author)

AD-A013 718/2GA PC$3.25/MF$2.25
Human Engineering Lab Aberdeen Proving Ground Md
The Effects of Paced Tapping on Heart Rate, Skin Conductance, and Muscle Potential.
Final rept.,
Nicholas John Carriero. 1975, 10p Rept no. HEL-TM-18-75
Availability: Pub. in Psychophysiology, v12 n2 p130-135 1975.

Descriptors: *Heart function tests, Taps, Response(Biology), Human factors engineering, Physiological effects, Attitudes(Psychology), Skin tests, Reprints.

The use of a tapping response as an indicant of interest in studies of the physiological correlates of attitude and attitude change is discussed. The physiological effects of paced tapping, using rates that might be employed in attitudinal studies, were examined under conditions free of attitudinal import. Major findings were: (1) There is no significant difference in the effect on HR with rates up to 3/sec. (2) There is no significant difference in the effect on SCL with rates up to 7/sec. (3) When raw EMG scores are used as the basis of analysis no significant differences are found with rates up to 3/sec. however, when the square root transform of this variable is used, a significant effect is found for all rates used in at least one of the phases of the experiment. The results, taken as a whole, indicate the possibility of either controlling or mathematically compensating for the

physiological effect of the tapping response, per se, in attitudinal studies. (Author)

AD-A013 781/0GA PC$3.25/MF$2.25
Office of Naval Research London (England)
Interdisciplinary Approaches in Science - Bioelectrochemistry and Biorheology as New Developments in Physiology.
Martin Blank. 23 Jul 75, 23p Rept no. ONRL-12-75

Descriptors: *Electrochemistry, *Rheology, Biomedicine, Medical research, Physiology.
Identifiers: Interdisciplinary programs, Biorheology, Bioelectrochemistry.

As science has developed into a more highly organized and automated activity, it appears to have changed in ways that have affected its traditional patterns of development. To overcome the constraints imposed by the new organization, scientists have formed interdisciplinary research areas as a creative way of approaching complex problems. This report reviews interdisciplinary research in general and two new areas that are developing in Western Europe, bioelectrochemistry and biorheology.

AD-A013 836/2GA PC$3.25/MF$2.25
California Univ San Diego La Jolla Dept of Physiology
Hypothalamic Control of Steno's Gland Activity in the Dog.
Final scientific rept.,
H. T. Hammel, and G. J. Kenagy. 1975, 20p
AFOSR-TR-75-1101
Grant AF-AFOSR-2531-73

Descriptors: *Salivary glands, *Hypothalamus, Dogs, Brain, Nerves, Secretion, Physiology.
Identifiers: *Neurophysiology, *Stenos gland, Thermoregulation.

The major objective of this investigation was to ascertain whether Steno's gland in the dog was superior to the salivary glands as an indicator of neural activity of the thermoregulatory neurones in the rostral brainstem. Although it is concluded from the results of the experiments that the secretion rate of Steno's gland is a thermoregulatory response, the fact that the magnitude of the response is low and variable renders it inferior to the salivary glands as a monitor of neurological activity.

AD-A013 853/7GA PC$3.75/MF$2.25
Federation of American Societies for Experimental Biology Bethesda Md Life Sciences Research Office
The Rhythmic Cycles in Man.
Technical rept.,
Herbert Pollack. Apr 75, 27p AFOSR-TR-75-1126
Contract F44620-74-C-0077, ARPA Order-2808

Descriptors: *Biological rhythms, Circadian rhythms, Humans, Motivation, Stimulation(Physiology), Performance(Human), Interruption, Medical research, Physiology.

There is ample evidence to accept the concept of multiplicity of cyclic and rhythmic functions in plants, animals and man. These vary from the ultradian and circadian to seasonal and annual cycles. There are numerous factors involved in these cyclic phenomena, from photostimulation (day-night cycle) to exhaustion-replenishment feedback mechanisms. Man's ability to override the rhythms is an important factor which allows him to undertake many activities and not be limited by the rhythmic nature of these underlying mechanisms. The override capability enables him to maintain his work performance efficiently providing he is motivated and interested. Thus motivation may be more important than the circadian rhythm which can be disrupted but restored easily with the proper stimulation. The report reviews research in this field and notes areas for future research and names key investigators.

AD-A013 854/5GA PC$3.75/MF$2.25
Federation of American Societies for Experimental Biology Bethesda Md Life Sciences Research Office
Neural Integration in Learning and Memory: A Hypothesis,
Sven A. Bach. Apr 75, 37p AFOSR-TR-75-1123
Contract F44620-74-C-0077, ARPA Order-2808

Descriptors: *Nerve cells, *Learning, *Memory(Psychology), *Neurochemistry, Brain, Metabolism, Biological rhythms, Metabolites, Hypotheses, Psychophysiology, Biochemistry.

Presented is a hypothesis concerning neural integration in learning and memory based on biochemical events in this time domain. The hypothesis suggests that one of the events involved in intraneuronal message transfer may be pumping of lattice-vibrational states by signals pulsed to match the relaxation time of such states. The energy levels attainable can in turn match those required for conformational changes in macromolecules. Intracellular processes may play an equal or larger role in neural functioning than events measurable across the cell-membrane. The hypothesis provides a basis for study of early, time-variable concentrations of metabolic intermediates, metabolites and secretory products of neurons during memory and learning.

AD-A014 052/5GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Separation of Useful Signal from Noise in the Neuronal Impulse Activity of the Cochlear Nucleus of a Cat,
E. A. Radionova. 30 Apr 75, 19p Rept no. FSTC-HT-23-706-75
Trans. of Zhurnal Vysshei Nervnoi Deyatelnosti (USSR) v15 n3 p481-489 1965.

Descriptors: *Cochlear nerve, *Auditory perception, Physiology, Acoustic signals, Noise(Sound), Separation, Cats, Laboratory animals, Experimental data, Translations, USSR.
Identifiers: Neurophysiology, *Auditory masking.

The detection and separation of useful signals from noise was studied with 180 neurons of the cochlear nucleus of a cat in sodium amytal narcosis. Characteristics of background activity of neurons of the cochlear nucleus were investigated as to the masking of useful signal by background and as to the distribution of neurons in terms of spontaneous activity.

N75-26637/9GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Redox Transformations of Nicotinamide-Adeninedinucleotide in Skeletal Muscles During Work and at Rest.
N. R. Chagovets, and L. G. Leshkevich. Jun 75, 13p NASA-TT-F-16432
Contract NASW-2483
Tran-Transl. Into English from Vop. Med. Khim. (Ussr), V. 20, No. 4, Jul.-Aug. 1974 p 425-429.

Descriptors: *Adenines, *Musculoskeletal system, *Nicotinamide, *Nucleotides, Biomedical data, Blood, Lactates, Physical work, Pyruvates, Rats.

For abstract, STAR 1317

N75-26639/5GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Effect of Lumisterol-3 on the Calcium Absorption in the Gut and on the Calcification of Bone Tissue.
N. N. Govseyeva. Jun 75, 9p NASA-TT-F-16422
Contract NASW-2481
Tran-Transl. Into English from Prikl. Biokhim. Mikrobiol. (Ussr). V. 10, No. 4, Jul. - Aug. 1974 p 581-583.

Descriptors: *Bones, *Calcification, *Calcium, *Hormone metabolisms, *Intestines, *Transport properties, Activation (Biology), Biosynthesis, Calciferol, Chickens, Hormones, Stimulation.

For abstract, STAR 1317

N75-26801/1GA PC$3.75/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Volume Production in Binaural Hearing of Complex Noises.
H. Niese. Jun 75, 34p NASA-TT-F-16430
Contract NASW-2481
Tran-Transl. Into English from Hochfrequenztech. Elektroakust. (East Germany), V. 70, No. 4, Aug. 1961 p 132-141.

Descriptors: *Auditory perception, *Binaural hearing, *Microphones, *Noise reduction, Graphs (Charts), Monaural signals, Noise measurement, Noise spectra, Sound waves.

For abstract, STAR 1317

PB-243 847/1GA
Mag Tape $150.00;Foreign $190.00
National Inst. of Neurological and Communicative Disorders and Stroke, Bethesda, Md.
Nerve Membrane Model.
Models-simulation,
Richard Fitzhugh. 1 Aug 75, 1 reel mag tape
NIH/DF-75/001
Specify tape recording mode desired: 9 track, 800 or 1600 bpi, odd parity, EBCDIC; or 7 track, 556 or 800 bpi, odd or even parity, BCD. Documentation available.

Descriptors: *Models-simulation, *Nerve cells, *Computer programs, Simulation, Membranes(Biology), Magnetic tapes, Data storage, Mathematical models, Nervous system, Physiology.
Identifiers: *Neurophysiology.

There are four FORTRAN programs to compute numerical solutions to the Hodgkin-Huxley equations for a space-clamped nerve membrane in response to stimuli consisting of current pulses and/or steps, and to compute threshold values of such stimuli, in either single or double precision. These programs will be of use to neurophysiologists who wish to compute theoretical curves of membrane potential versus time for space and current clamped axons, or threshold values of stimuli, for comparison with experiment. Since the specification of the model is confined to a few subroutines, it is simple to modify the equations and change the model. The programs are designed for interactive use on a time-sharing computer (DECsystem-10), but can be modified for use on other computers. Instructions for use and test runs are given in the first file HINFO on the tape.

6R. Radiobiology

AD-A013 644/0GA PC$7.00/MF$2.25
Louisville Univ Ky
Study of Ocular Effects of Chronic Exposure to Laser Radiation.
Rept. no. 3 (Final), 1 Apr 68-31 Aug 73,

T. Lawwill, F. Sharp, and N. Speed. 31 Aug 73, 200p
Contract DADA17-68-C-8105

Descriptors: *Radiation effects, *Eye, Pathology, Exposure(Physiology), Lasers, Thresholds(Physiology), Radiation dosage, Rabbits, Ophthalmology, Monkeys, Experimental data, White light, Argon lasers.
Identifiers: *Laser radiobiology.

The project is a study of the effects of long term exposure of the eye to laser radiation. The data is for four hour, wide field exposures at levels below immediate damage threshold for rabbit and monkey eyes. The report compares the thresholds for white light and the 514.5 and 488.0 nm lines of the argon laser. From this information a hypothesis is proposed as to the mechanism of damage and methods are proposed to test this hypothesis. If the mechanism can be established, generalizations can be made for different conditions and different light sources.

AWRE-Trans-67 PC$4.00/MF$2.25
Foersvarets Forskningsanstalt, Stockholm (Sweden).
Emp Effects on Mankind.
M. Wik. Apr 75, 12p
Translation by F.E. Wallwork and D.R. Quested of FOA--4-A-4500-29. U.S. Sales Only.

Descriptors: (*Electromagnetic pulses, *Biological effects), (*Personnel, *Health hazards), Biological shock, Electrical equipment, Electricity, Man, Nuclear explosions, Safety.

For abstract, see NSA 32 03, number 06666.

BNL-19557 PC$6.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Radiation Carcinogenesis, Laboratory Studies.
C. J. Shellabarger. 1974, 58p CONF-750128-2

Descriptors: (*Carcinogenesis, *Reviews), (*Neoplasms, *Radioinduction), (*Hormones, *Radiosensitivity effects), (*Man, *Radiation hazards), Alpha particles, Data, Dose rates, Dose-response relationships, Electrons, Fractionated irradiation, Let, Life span, Neutrons, Rats, Rbe, Skin.

For abstract, see NSA 32 03, number 06714.

BNL-19951 PC$4.50/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Modifying Factors in Rat Mammary Gland Carcinogenesis.
C. J. Shellabarger. 1975, 27p CONF-750443-2

Descriptors: (*Carcinomas, *Radioinduction), (*Cholanthrene, *Biological effects), (*Stilbestrol, Biological effects), (*Mammary glands, Carcinomas), Biological radiation effects, Carcinogens, Dose-response relationships, Fractionated irradiation, Let, Methyl radicals, Radiation doses, Rats, Response modifying factors, Synergism, Viruses, X radiation.

For abstract, see NSA 32 03, number 06715.

BNWL-SA-5037(Rev.) PC$5.25/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Detection of Plutonium with an Intraesophageal Probe.
K. L. Swinth, J. F. Park, G. L. Voelz, and J. H. Ewins. Jan 75, 20p CONF-750707-1
Contract AT(45-1)-1830

Descriptors: (*Plutonium, *Radiation monitoring), (*Lymph nodes, *Radionuclide kinetics), (*Personnel dosimetry, *Scintillation counters), (*Trachea, Radionuclide kinetics), Inhalation, Internal irradiation, Measuring instruments, Performance testing, Personnel, Probes, Radiation doses, Retention, Uptake.

For abstract, see NSA 32 03, number 06822.

BNWL-SA-5339 PC$8.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Biological Effects of Transuranium Elements in Experimental Animals.
W. J. Bair. 15 Apr 75, 96p CONF-750436-1
Contract AT(45-1)-1830

Descriptors: (*Plutonium 238, *Biological radiation effects), (*Plutonium 239, Biological radiation effects), (*Americium 241, Biological radiation effects), (*Curium 242, Biological radiation effects), Alpha particles, Body burden, Carcinogenesis, Chronic irradiation, Dose-response relationships, Inhalation, Injection, Internal irradiation, Laboratory animals, Radiation doses, Radioinduction, Radionuclide administration, Radionuclide kinetics, Skin absorption, Tissue distribution.

For abstract, see NSA 32 03, number 06796.

BNWL-SA-5367 PC$4.75/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Model for Predicting Strontium-90 Levels in Mule Deer.
R. G. Schreckhise, and F. W. Whicker. Mar 75, 35p CONF-750503-14
Contract AT(11-1)-1156

Descriptors: (*Deer, *Radionuclide kinetics), (*Strontium 90, *Retention), (*Strontium 85, Retention), Age dependence, Biological models, Chronic intake, Females, Forecasting, Gastrointestinal tract, Males, Seasonal variations.

For abstract, see NSA 32 03, number 06829.

BNWL-SA-5380 PC$4.50/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Uranium in Man Based on Urinary Excretion Data.
K. R. Heid, W. P. Walsh, and J. R. Houston. 1974, 30p CONF-750445-2

Descriptors: (*Uranium, *Clearance), (*Lungs, *Radionuclide kinetics), (*Bone tissues, Radionuclide kinetics), (*Blood, Radionuclide kinetics), Biological models, Data, Dose commitments, Excretion, Uptake, Urine.

For abstract, see NSA 32 03, number 06823.

CEA-R-4655 PC$14.75/MF$2.25
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. de Protection.
Dosimetric and Microdosimetric Investigations on High L.E.T. Particle BEAMS.
A. Bridier, and P. Fache. Mar 75, 231p
In French. U.S. Sales Only.

Descriptors: (*Helium ions, *Dosimetry), (*Fast neutrons, Dosimetry), (*Tissue-equivalent materials, *Ion dosimetry), Helium 3 beams, Mev range 100-1000, Microdosimetry, Neutron dosimetry, Spatial dose distributions.

For abstract, see NSA 32 03, number 07867.

CONF-750331-1 PC$4.00/MF$2.25
Chicago Univ., Ill. Dept. of Radiology.
Image Quality and Patient Exposure in Mammography, Tomography, Angiography, and Bone Radiography.
A. G. Haus, K. Rossmann, K. Doi, and J. T. Chiles. 1975, 14p SM-193/41

Descriptors: (*Patients, *Radiation doses), (*Biomedical radiography, Radiation doses), Diagnostic techniques, Images, Radiation dose distributions, Variations, X radiation.

For abstract, see NSA 32 03, number 06667.

CONF-750518-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Average Dose to an Organ Per Microcurie-Day Accumulated by a Radionuclide in a Source Organ.
W. S. Snyder, and M. R. Ford. 1975, 4p

Descriptors: (*Man, Radiation dose distributions), (*Radioisotopes, Radiation dose distributions), (*Radiation dose distributions, *Computer calculations), (*Organs, Radiation dose distributions), Decay, Energy-level transitions, Interactions, Internal conversion, Internal irradiation, Monte carlo method, Phantoms, Radiation doses, Tissue-equivalent materials.

For abstract, see NSA 32 03, number 06790.

COO-2000-117 PC$4.00/MF$2.25
Purdue Univ., Lafayette, Ind.
Low-Level X-Irradiation of the Brain During Development: Morphological, Physiological, and Behavioral Consequences. Progress Report, September 1, 1974--August 31, 1975.
J. Altman. 1975, 15p
Contract AT(11-1)-2000

Descriptors: (*Brain, *Delayed radiation effects), Age dependence, Behavior, Biological radiation effects, Congenital malformations, Dose rates, Dose-response relationships, Morphological changes, Physiology, Prenatal irradiation, Radiation doses, Rats, X radiation.

For abstract, see NSA 32 03, number 06716.

LF-49 PC$10.60/MF$2.25
Lovelace Foundation for Medical Education and Research, Albuquerque, N.Mex.
Inhalation Toxicology Research Institute Annual Report, 1973--1974.
B. B. Boecker, and F. C. Rupprecht. Dec 74, 384p

Descriptors: (*Radioactive aerosols, Inhalation), (*Inhalation, *Research programs), Animals, Leading abstract, Toxicity.

No abstract available.

NERC-LV-539-36 PC$5.45/MF$2.25
National Environmental Research Center, Las Vegas, Nev.
Actinide Concentrations in Tissues from Cattle Grazing Near the Rocky Flats Plant.
D. D. Smith, and S. C. Black. Feb 75, 47p
Contract AT(26-1)-539

Descriptors: (*Uranium, *Radiation monitoring), (*Plutonium 239, Radiation monitoring), (*Americium 241, Radiation monitoring), (*Rocky flats plant, Radiation monitoring), Cattle, Diffusion, Environment, Food chains, Forage, Ingestion, Radionuclide kinetics, Radionuclide migration, Sampling, Soils, Tissue distribution, Uptake.

For abstract, see NSA 32 03, number 06874.

NRPB-R-31 PC$9.50/MF$2.25
National Radiological Protection Board, Harwell (UK).
Radiological Protection of People Exposed to Plutonium: Current Research at the National Radiological Protection Board.
J. W. Stather, F. E. H. Crawley, D. S. Popplewell, G. N. Stradling, and J. Brightwell. Oct 74, 127p
U.S. Sales Only.

Descriptors: (*Radiation protection, *Research programs), (*Plutonium 239, *Clearance), (*Plutonium 238, Clearance), (*Americium 241, Clearance), Chromosomal aberrations, Curium 242, Lavage, Lungs, Lymphocytes, Man, Plutonium, Quantitative chemical analysis, Radioinduction, Radionuclide kinetics, Rats, Respiratory system, Tissue distribution, United kingdom organizations, Urine.

For abstract, see NSA 32 03, number 06670.

NUS-217 PC$7.25/MF$2.25
NUS Corp., Washington, D.C.
Calculational Models for beta Dose from Spherical Particles.
G. H. Anno. 26 Feb 65, 82p

Descriptors: (*Beta dosimetry, *Spatial dose distributions), (*Tissue-equivalent materials, Beta dosimetry), (*Fuel particles, Beta dosimetry), (*Rover reactors, Fuel particles), Mathematical models, Radiation hazards, Spheres.

For abstract, see NSA 32 03, number 07871.

NUS-229(Rev.) PC$5.50/MF$2.25
NUS Corp., Washington, D.C.
Dose Calculation Models for Re-Entering Nuclear Rocket Debris.
A. W. DeAgazio. Oct 65, 49p

Descriptors: (*Space propulsion reactors, *Radiation doses), (*Human populations, Radiation doses), (*Beta dosimetry, *Mathematical models), (*Gamma dosimetry, Mathematical models), Cesium 137, External irradiation, Ingestion, Inhalation, Internal irradiation, Particles, Radiation dose distributions, Reentry, Skin, Strontium 90.

For abstract, see NSA 32 03, number 07872.

ORO-3408-22 PC$4.00/MF$2.25
Texas Univ., Austin Dept. of Zoology.
Progress Report and Renewal Request for Period August 15, 1975--August 14, 1976.
E. L. Powers. May 75, 13p
Contract AT(40-1)-3408

Descriptors: (*Bacillus megatherium, *Biological radiation effects), (*Algae, Biological radiation effects), Benzyl radicals, Biochemical reaction kinetics, Butanols, Chlorella, Mutations, Peroxy radicals, Photosynthesis, Radiosensitivity, Radiosensitivity effects, Response modifying factors, Spores, Survival time, X radiation.

For abstract, see NSA 32 03, number 06644.

RD/B/M-3281 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Notes on the Second Symposium on Neutron Dosimetry in Biology and Medicine, Neuherberg, Munich, 30TH September--4TH October 1974.
J. R. Harvey. Jan 75, 13p
U.S. Sales Only.

Descriptors: (*Neutron dosimetry, *Meetings), (*Neutron capture therapy, *Radiation dose distributions), (*Neutrons, Radiation dose distributions), Biological radiation effects, Medicine, Neutron spectroscopy, Patients, Radiobiology, Radiotherapy.

For abstract, see NSA 32 03, number 06671.

SAAS-173 PC$4.25/MF$2.25
Staatliches Amt fuer Atomsicherheit und Strahlenschutz, Berlin (German Democratic Republic).
Reports of the State Ministries for Atomic Safety and Radiation Protection of the Ddr.
Dec 74, 21p
In German. U.S. Sales Only.

Descriptors: (*German democratic republic, *Personnel dosimetry), Leading abstract, Radiation protection.

For abstract, see NSA 32 03, number 06672.

UR-3490-730 PC$4.25/MF$2.25
Oak Ridge Associated Universities, Inc., Tenn. Medical Div.
Effects of Gonadal Irradiation on Clinical Radiation Therapy: A Review.
C. C. Lushbaugh, and G. W. Casarett. 1974, 25p
CONF-750128-3

Descriptors: (*Patients, *Biological radiation effects), (*Gonads, Biological radiation effects), (*Radiotherapy, *Radiation hazards), Congenital malformations, External irradiation, Females, Genetic radiation effects, Males, Progeny, Statistics.

For abstract, see NSA 32 03, number 06674.

6S. Stress Physiology

AD-A013 706/7GA PC$3.25/MF$2.25
School of Aerospace Medicine Brooks AFB Tex
Prevention of Decompression Sickness during a Simulated Space Docking Mission.
Final rept. Sep 73-Dec 74,
Julian P. Cooke, Randy R. Bollinger, and Billy Richardson. 1975, 6p Rept no. SAM-TR-75-254
Contract NASA-T-82170
Availability: Pub. in Aviation, Space and Environmental Medicine, p930-933 Jul 75.

Descriptors: *Decompression sickness, Controlled atmospheres, Space simulation chambers, Spacecraft docking, Astronauts, Adaptation(Physiology), Space crews, Reprints.
Identifiers: *Apollo-Soyuz spacecraft docking, *Cosmonauts.

This study has shown that repetitive exchanges between the American Apollo space vehicle atmosphere of 100% oxygen at 5 psia (258 torr) and the Russian Soyuz spacecraft atmosphere of 30% oxygen-70% nitrogen at 10 psia (523 torr), as simulated in altitude chambers, will not likely result in any form of decompression sickness. This conclusion is based upon the absence of any form of bends in 7 crewmen who participated in 11 tests distributed over three 24-hr periods. During each period, 3 transfers from the 5 to the 10 psia environments were performed by simulating passage through a docking module which served as an airlock where astronauts and cosmonauts first adapted to each other's cabin gases and pressures before transfer. Biochemical tests, subjective fatigue scores, and the complete absence of any form of pain were also indicative that decompression sickness should not be expected if this spacecraft transfer schedule is followed. (Author)

AD-A014 007/9GA PC$5.25/MF$2.25
Hawaii Univ Honolulu Dept of Physiology
Work Capacity and Cardiovascular Adjustments of Non-Diving Mammals in Hyperbaric Environment.
Final rept. 1 Feb 72-31 Jul 75,
Y. C. Lin, L. H. Chen, and D. G. Baker. 31 Jul 75, 106p
Contract N00014-67-A-0387-0014

Descriptors: *Cardiovascular system, *Hyperbaric conditions, *Pressure breathing, *Diving, *Performance(Human), Oxygen consumption, Stress(Physiology), Blood circulation, Blood pressure, Heart, Helium, Rats, Laboratory animals, Experimental data.
Identifiers: Animal models.

Some factors which limit human performance in the hyperbaric environments have been studied in the past, employing a controlled environment consisting of lumped parameters of pressure, gas density, levels of partial pressure of oxygen, carbon dioxide, and inert gases, ambient temperature, and humidity. The present study was designed to examine the possible interaction among these variables on the work capacity of rats, at rest and during exercise. The rat, like man, is a terrestrial non-diving mammal, and is the model employed in this study. Swimming was utilized in the present study as a means of imposing a work load on the rat. Measurements of cardiac output and its distribution, autonomic nervous control of cardiovascular functions, and oxygen consumption and conservation during apnea were studied in detail. The authors have studied the specific helium effects in the intact animal and in the isolated-perfused heart.

N75-26633/8GA PC$3.75/MF$2.25
California Univ., Davis.
Evaluation of the Effects of Hypergravity Exposu.e and Caging Restraint on Bone Mineralization in the Beagle by in Vivo Photon Absorptiometry.
Final Progress Report.
G. L. Fisher, K. L. Berding, and M. Goldman.
May 75, 29p NASA-CR-137710
NASA ORDER A-98313-A

Descriptors: *Bones, *Dogs, *Evolution (Development), *Gravitational effects, *Minerals, Biological effects, Body weight, Bone marrow, Hypokinesia.

For abstract, STAR 1317

N75-26636/1GA PC$3.25/MF$2.25
Public Health Service Hospital, Staten Island, N.Y.
Renal Effects of Continuous Negative Pressure Breathing.
Final Report.
M. J. Kinney, and V. A. Discala. 1975, 20p NASA-CR-141888
NASA ORDER T-2950-A

Descriptors: *Breathing, *Renal function, *Weightlessness, Diuresis, Potassium, Rats, Sodium, Urinalysis.

For abstract, STAR 1317

N75-26638/7GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
How'S Your Health, Cosmonaut .
I. Bryanov, and R. Bayevskiy. 14 Jun 75, 7p
NASA-TT-F-16331
Contract NASW-2483
Tran-Transl. Into English from Izvestiya (Ussr), 8 Feb. 1975 p 5.

Descriptors: *Astronaut performance, *Biomedical data, *Cosmonauts, *Health physics, Clinical medicine, Heuristic methods, Physical work, Physiological factors.

For abstract, STAR 1317

6T. Toxicology

AD-A013 886/7GA PC$3.25/MF$2.25
Texas Univ Health Science Center San Antonio Dept of Pharmacology

Neurobiology and Influences on Behavior,
Kenneth Blum, Kathy C. Hudson, Richard N. Friedman , and Jack E. Wallace. 1974, 17p
AFOSR ITR-75-1223
Grant AF-AFOSR-2074-71
Availability: Pub. in Drug Addiction, v3 p39-53 1974.

Descriptors: *Toxicology, *Drug addiction, Alcohols, Withdrawal symptoms, Cannabinols, Dosage, Hazards, Behavior, Humans, Reprints.
Identifiers: Tetrahydrocannabinol.

Findings seem to suggest a possible beneficial role for tetrahydrocannabinol in the treatment of acute alcohol withdrawal. Because of the observed unpredictability of this drug's action (depressant or stimulatory, depending upon the dose), the authors caution against such utilization of the drug until further research has been accomplished. (Author)

AD-A013 887/5GA PC$3.25/MF$2.25
Texas Univ Health Science Center San Antonio Dept of Pharmacology
New Aspects of Analytical and Clinical Toxicology,
Kenneth Blum, Linda McDonald, James Maddux, and Jack E. Wallace. 1974, 6p AFOSR-TR-75-1222
Grant AF-AFOSR-2074-71
Availability: Pub. in Drug Addiction, v4 p123-126 1974.

Descriptors: *Toxicology, *Drug withdrawal, Injections(Medicine), Rats, Tolerances(Physiology), Drug addiction, Morphine, Withdrawal symptoms, Reprints.
Identifiers: *Methadone.

Female rats were made tolerant to and possibly dependent upon methadone by seven weeks of continuous subcutaneous injections twice daily. Distinct abstinence signs were observed. Withdrawal was monitored by assessing 'wet-dog' shakes, a procedure used to quantitate morphine dependence in rats. The data imply that wet-dog shakes may constitute a satisfactory index for determining methadone dependence in this species. (Author)

BNWL-SA-5349 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Toxicity Tests on the Combined Effects of Chlorine and Temperature on Rainbow (Salmo Gairdneri) and Brook (Salvelinus Fontinalis) Trout.
E. G. Wolf, M. J. Schneider, K. O. Schwarzmiller, and T. O. Thatcher. Mar 75, 20p CONF-750433-2
Contract AT(45-1)-1830

Descriptors: (*Trout, *Biological stress), (*Thermal effluents, *Biological effects), (*Chlorine, *Toxicity), Aquatic ecosystems, Dose-response relationships, Genetic variability, Mortality, Response modifying factors, Size, Synergism, Temperature dependence.

For abstract, see NSA 32 03, number 06463.

N75-26831/2GA PC$3.25/MF$2.25
California Univ., Los Angeles.
Continous Animal Exposure to a Mixture of Dichloromethane and 1,1,1-Trichloroethane.
Final Report.
1975, 25p NASA-CR-141889
NASA ORDER T-9035-B

Descriptors: *Animals, *Dichlorides, *Exposure, *Tolerances (Physiology), Breathing apparatus, Concentration (Composition), Human factors engineering, Liver, Methyl chloride, Spacecraft environments.

For abstract, STAR 1317

N75-26832/0GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Relationship Between Administration Time of Drugs and Acute Toxicity in Mice.
Jun 75, 17p NASA-TT-F-16411
Contract NASW-2483
Tran-Transl. into English from Pharmacologica Japonica, V. 71, 1975 p 29-37.

Descriptors: *Central nervous system depressants, *Central nervous system stimulants, *Toxicity, Circadian rhythms, Drugs, Mice, Mortality.

For abstract, STAR 1317

PB-243 826/5GA PC$4.75/MF$2.25
Miami Univ., Fla. Dept. of Epidemiology and Public Health.
Occupational and Environmental Pesticide Exposure Study in South Florida.
Annual rept. 1 Jan-31 Dec 74,
John E. Davies. Mar 75, 92p EPA/650/1-75-002
Contract EPA-68-02-1277

Descriptors: *Industrial medicine, *Public health, *Toxicology, Phosphorus organic compounds, Ecology, Environments, Exposure, Toxic diseases, Excretion, Florida.
Identifiers: *Pesticide toxicity, Phthalic acid/(diethyl-ester), Urinalysis.

Multiresidue analysis of urinary pesticide metabolites offer an effective means of measurements of human exposure to the non-persistent pesticides. In studies of different degrees of human exposure to parathion DEP, a metabolite of paraoxon, was the most sensitive indicator of serious exposure. Concentrations in cases of >0.4 microgram/ml were observed in first urines collected in seven cases of poisoning with serious enzyme inhibition. In contrast, from 71 sequential urines in parathion exposed workers on one urine exceeded these concentration. The DEP:DETP ratio was equally informative: the mean ratio being 4.14 in 20 urines from the poison cases and 0.88 in urines of exposed workers. Excretion of metabolites for 91 days after ingesting of Dichlofenthion was observed, emphasizing the significance of exposures to the less polar organophosphates in both acute and chronic effects. A variety of pesticides were identified in a regular air monitoring program for pesticides in South Florida.

PB-243 988/3GA PC$3.25/MF$2.25
Michigan Univ., Ann Arbor. Medical School.
Accumulation, Toxicity, and Metabolism of Common Plasticizers in Humans.
Progress rept.,
Edward A. Napier, Jr. May 75, 19p UMICH-13316-4-PA
Contract N01-HB-52902
See also PB-224 454.

Descriptors: *Plasticizers, *Toxicity, *Medical supplies, Leaching, Phthalates, Antioxidants, Humans, Plastics.

Studies have shown that considerable leachable organic compounds are released from plastic containers and tubings as used for example, in hemodialysis patients. Commonly used plasticizers such as phthalate esters and other non-phthalide compounds, including antioxidents, have also been demonstrated to be toxic to cell cultures of humam fetal fibroblasts of the WI-38 strain.

7. CHEMISTRY

7A. Chemical Engineering

N75-26193/3GA PC$4.25/MF$2.25
Oxford Univ. (England). Dept. of Engineering Science.
Identification and Control of a Distillation Column.
O. L. R. Jacobs, and D. A. J. Dyer. 1975, 66p
OUEL-1115/75
Contract SRC-B/SR/90732

Descriptors: *Columns (Process engineering), *Control equipment, *Distillation, *Feedback control, Algorithms, Mathematical models.

For abstract, STAR 1317

PAT-APPL-488 082/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
A Process and Composition for Cleaning Hot Fuel Gas.
Patent Application,
Raymond H. Moore. Filed 12 Jul 74, 14p
DOCKET/OCR-2263
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Manufactured gas, *Gas purification, *Air pollution control, Fused salts, Calcium carbonates, Sulfur, Hydrogen sulfide, Particles, Cleaning.
Identifiers: PAT-CL-423-232, Fuel gas.

The patent application relates to a novel composition comprising a molten mixture of calcium carbonate dissolved in alkali metal carbonates and to a process for use of this salt composition in the cleaning of hot fuel gas streams containing particulate materials and hydrogen sulfide as contaminants. These are often produced in coal gasification. A ternary mixture of the carbonates of potassium, lithium and sodium having dissolved therein about 10 to 20 mole percent calcium carbonate is preferred. Incorporation of calcium carbonate in the molten alkali carbonate mixture results in a more efficient extraction of hydrogen sulfide from hot fuel gases over a larger temperature range than is possible using molten alkali metal carbonates alone. Additionally, higher concentrations of moisture and carbon dioxide can be tolerated.

PAT-APPL-491 012/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Method and Apparatus for Direct Contact Multi-Stage Flash Desalination.
Patent Application,
Arthur L. Kohl, Thomas T. Shimazaki, and William B. Suratt. Filed 23 Jul 74, 22p
DOCKET/SAL-1974
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Desalting, Distillation, Flashing, Brines.
Identifiers: *Multistage flash distillation.

A multi-stage flash, direct contact condensation method and apparatus for purifying brine is disclosed in the patent application which eliminates costly apparatus previously required while maintaining adequate volume to efficiently produce potable water by use of gravity fed sprays of condensate upon which previously flashed steam is allowed to condense.

PAT-APPL-501 002/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Method for the Decomposition of Hydrogen Sulfide.
Patent Application,

Larry A. Haas. Filed 15 Aug 74, 22p
DOCKET/MIN-2142
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Hydrogen sulfide, *Air pollution control, *Electric discharges, Decomposition.

Hydrogen sulfide is one of the most toxic of gases, even more harmful than phosgene and cyanide gases. It is also very corrosive and responsible for the rapid deterioration of equipment. In view of these harmful effects of hydrogen sulfide there has been concerted efforts directed toward increasing the removal efficiencies of hydrogen sulfide to avoid secondary pollution. One object of the invention, therefore, is to provide a one-step process for the decomposition of hydrogen sulfide directly into hydrogen and elemental sulfur. Another object is to provide a one-step process for converting hydrogen sulfide to non-toxic products at atmospheric pressure and at low temperatures such as ambient temperatures. Yet another object is to reduce atmospheric pollution by reducing the concentration of hydrogen sulfide in industrial gas by-products containing same while simultaneously producing hydrogen and elemental sulfur. These and other objects of the invention are obtained by exposing a gas containing hydrogen sulfide to a silent electrical discharge obtained by a voltage sufficient to effect decomposition.

PAT-APPL-501 550/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Scale Inhibition.
Patent Application,
Alwyn H. Taylor. Filed 29 Aug 74, 15p
DOCKET/SAL-1981
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Corrosion inhibition, *Scale(Corrosion), *Heat exchangers, *Plastic coatings, Coating processes, Phenolic resins.

Scale formation on heated surfaces is a continuous problem in evaporation of waters containing scale-forming salts, e.g., in distillation of sea water, steam boilers, etc. specifically, heat exchanger surfaces of evaporative desalination plants are subject to formation of large quantities of scale, particulary calcium sulfate, resulting from the presence of high concentrations of scale-forming divalent cations anions. This scale impedes heat transfer through the walls of the heat exchanger and seriously interferes with the efficiency of the process. This patent application discusses the inhibition of scale on heat exchanger surfaces in contact with solutions containing scale-forming salts by electrodeposition of polymerized phenol or phenylenediamine on the surfaces. The deposition is accomplished by holding the heat exchange surfaces at a controlled electrical potential in the presence of a solution containing a low concentration of the monomer.

PAT-APPL-515 779/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Differential Distillation of Helium and Apparatus Therefor.
Patent Application,
Filed 17 Oct 74, 17p DOCKET/MIN-2163
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Helium 4, *Isotope separation, Distillation, Helium 3, Cryogenics, Laboratory equipment.

A method for the production of essentially pure helium-4 isotope gas is described in this patent application; it will yield substantial volumes of both helium-4 containing of the order of 1 part per billion helium-3 and an enriched helium-3 gas mixture. Differential distillation of liquid helium below the lambda point (2.17 K.) is employed to achieve these ends. Additionally, an apparatus is disclosed which is capable of producing commerical volumes of these gases.

PAT-APPL-539 889/GA PC$3.25/MF$2.25
Energy Research and Development Administration, Washington, D.C.
Methanation Process.
Patent Application,
Charles W. Matthews. Filed 23 Jan 75, 9p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Carbon monoxide, *Hydrogenation, *Manufactured gas, Methane, Concentration(Composition).
Identifiers: *Methanation.

An improved process for the methanation of a feed gas containing hydrogen and relatively high amounts of carbon monoxide, such as obtained in coal gasification, is disclosed in the patent application. Due to the highly exothermic reaction between carbon monoxide and hydrogen, it is found that temperature levels in the catalyst beds are such that catalyst damage occurs where high proportions of carbon monoxide, for example more than 5% by weight, are present in the feed gas. Excessive temperatures and catalyst damage are avoided by diluting the feed gas to a carbon monoxide level of about 4% with a non-reacting gas such as the methane formed in the reaction which can be recycled for this purpose.

PAT-APPL-551 225/GA PC$3.25/MF$2.25
Energy Research and Development Administration, Washington, D.C.
Electrode Assembly.
Patent Application,
F. C. Schora, Jr. Filed 19 Feb 75, 18p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fluidized bed processors, *Patent applications, *Electrodes, Cylindrical bodies, Coal gasification, Heating equipment.

The patent application is applicable in the art of electrical heating, such as heating particle beds and especially to fluidized bed types of chemical reactors. The invention provides a special electrode assembly which is adapted to heat the particle bed in a fluidized reactor. The electrode assembly consists of a high voltage electrode having a generally cylindrical shape and being electrically connected to a high voltage source.

PB-243 556/8GA PC$4.75/MF$2.25
Hawaii Univ., Honolulu. Coll. of Business Administration.
Desalting Plants Inventory Report No. 5,
Nabil A. El-Ramly, and Charles F. Congdon. Mar 75, 85p W75-09852
Contract DI-14-30-3286

Descriptors: *Desalting, Industrial plants, Inventories, Surveys, Tables(Data), United States, Water treatment.
Identifiers: *Water treatment plants.

Contents: Desalting plants by location; Desalting plants by process; Plants 1 million GPD or over; Partial listing of desalting plant sales.

PB-243 641/8GA PC$7.00/MF$2.25
Midwest Research Inst., Kansas City, Mo.
Survey of Industrial Processing Data. Task I - Hexachlorobenzene and Hexachlorobutadiene Pollution from Chlorocarbon Processing.
Final rept. Jun 73-Oct 74,
Charles E. Mumma, and Edward W. Lawless.
Jun 75, 187p* EPA/560/3-75/003
Contract EPA-68-01-2105

Descriptors: *Chlorine organic compounds, *Chemical industry, *Industrial wastes, *Environmental impacts, Surveys, Benzenes, Butadienes, Air pollution, Water pollution, Toxicology, Solid waste disposal, Manufacturing, Butadienes.
Identifiers: *Benzene/hexachloro, *Butadiene/hexachloro.

This study was made to evaluate the potential for environmental contamination by hexachlorobenzene and hexachlorobutadiene. Information acquisition and evaluation activities were designed to identify proven or potential sources of HCB and HCBD and the environmental and health effects of these substances. In addition to HCB and HCBD, this study included 21 other domestically produced chemicals which were either known sources of HCB and/or HCBD or theoretically capable of generating these substances as by-products, waste materials, or impurities in a commercial product. The scope of the study for each of these chemicals included identification of production sites and volumes, descriptions of manufacturing processes and environmental and health aspects, description of waste disposal methods, and identification of commercial uses for these products. An important goal was the recommendation of specific plant sites that should be monitored by EPA to determine if they were sources of significant discharges or emissions of HCB and/or HCBD into the environment.

PB-243 690/5GA PC$4.25/MF$2.25
Midwest Research Inst., Kansas City, Mo.
Survey of Industrial Processing Data. Task II - Pollution Potential of Polybrominated Biphenyls.
Final rept. Dec 74-Jun 75,
Charles E. Mumma, and Dennis D. Wallace. Jun 75, 57p* EPA/560/3-75/004
Contract EPA-68-01-2105

Descriptors: *Bromine aromatic compounds, *Chemical industry, *Industrial wastes, *Environmental impacts, Surveys, Biphenyls, Air pollution, Water pollution, Solid waste disposal, Toxicology, Manufacturing.
Identifiers: *Biphenyl/bromo.

This study was made to help the EPA evaluate the potential for environmental contamination by brominated biphenyls. The information collection and evaluation activities were designed to identify sources of brominated biphenyls and the environmental and health effects of these substances. The scope of the study included identification and evaluation of production sites and volumes, manufacturing processes and waste disposal practices, commercial uses and substitutes for products and environmental and health aspects.

PB-243 812/5GA PC$4.25/MF$2.25
National Research Council, Washington, D.C. Office of Chemistry and Chemical Technology.
The Proposed National Resource for Computation in Chemistry: A User-Oriented Facility.
Jun 75, 60p
Contracts NSF-C310, E(11-1)-2518

Descriptors: *Chemistry, *Computation, *Computer programming, Data processing.

The report addresses questions concerning the detailed planning of the organizational structure, management, scientific policy, facilities, site selection criteria, and funding of a national computational center designed to serve chemistry and related sciences. The report contains a questionnaire to proposed host institutions; it also contains a questionnaire sent to

potential users of the Resource and a summary of their responses.

7B. Inorganic Chemistry

AD-A013 817/2GA PC$3.75/MF$2.25
Georgia Univ Athens Dept of Chemistry
Transition Metal and Lanthanide Compounds.
Final rept. 1 Jan 71-30 Jun 75,
R. B. King. Jun 75, 33p AFOSR-TR-75-1170
Grant AF-AFOSR-2000-71

Descriptors: *Rare earth compounds, *Phosphorus heterocyclic compounds, Borates, Scientific research, Metalorganic compounds, Iron compounds, Cobalt compounds.

New research results in the following areas are briefly described: The synthesis of polyphosphines and their metal complexes including polyphosphines with terminal methyl and neopentyl groups; reactions of polypyrazolylborates with the metal complexes C5H5Co(CO)(R(f)I(R(f)E perfluoroalkyl group), C3F7Fe(CO)4I, ((CH3)3Pt)4, and C3H5Fe(CO3I; reactions of cyclopentadienyl and allyl molybdenum derivatives with alkyl isocyanides; redox chemistry of hexamethylbenzene niobium and tantalum derivatives; and lanthanide nitrate complexes of certain macrocyclic polyethers and the use of macrocyclic polyether columns for lanthanide separations.

AD-A014 021/0GA PC$3.25/MF$2.25
Rosenstiel School of Marine and Atmospheric Science Miami Fla
Apparent Molal Volumes and Heat Capacities of Alkaline Earth Chlorides in Water at 25 C,
Gerald Perron, Jacques E. Desnoyers, and Frank J. Millero. 3 May 74, 5p
Contract N00014-67-A-0201-0013, Grant PHS-GA-17386
Availability: Pub. in Canadian Jnl. of Chemistry, v52 n22 p3738-3741 1974.

Descriptors: *Alkaline earth compounds, Concentration(Chemistry), Density, Chlorides, Specific heat, Salts, Valence, Heat of activation, Calorimeters, Canada, Reprints.

The densities and volumetric specific heats of the alkaline earth chlorides have been measured in water at 25 C in the concentration range 0.01 to 0.4 M with a flow densimeter and a flow microcalorimeter. Apparent molal volumes and heat capacities have been derived. (Author)

AD-A014 022/8GA PC$3.25/MF$2.25
Rosenstiel School of Marine and Atmospheric Science Miami Fla
Apparent Molal Volumes and Heat Capacities of some Sulfates and Carbonates in Water at 25 C,
Gerald Perron, Jacques E. Desnoyers, and Frank J. Millero. 13 Nov 74, 6p
Contract N00014-67-A-0201-0013, Grant NSF-GA-17386
Availability: Pub. in Canadian Jnl. of Chemistry, v53 n8 p1134-1138 1975.

Descriptors: *Sulfates, *Carbonates, Concentration(Chemistry), Density, Salts, Specific heat, Thermochemistry, Heat of activation, Calorimeters, Alkali metal compounds, Canada, Reprints.

The densities and volumetric specific heats of Na2SO4, K2SO4, MgSO4, Na2CO3, NaHCO3, and NaOH were measured up to an ionic strength of 1 in water at 25 C with a flow densimeter and a flow microcalorimeter. From these data, the heat capacity for the formation of the ion pair MgSO4 was evaluated as 84.9 J K minus 1 mol minus 1. There is an anomalous increase in the apparent molal heat capacities of Na2CO3 at low concentration but the apparent molal volumes are normal. This anomaly can be suppresed with NaOH. Attempts to account quantitatively for this behavior by an hydrolysis correction were not successful. (Author)

AD-A014 026/9GA PC$3.25/MF$2.25
Rosenstiel School of Marine and Atmospheric Science Miami Fla
Thermometric Titration Analysis of Seawater for Chlorinity, Sulfate, and Alkalinity,
Frank J. Millero, Sheldon R. Schrager, and Lee D. Hansen. 7 Nov 73, 6p Rept no. Contrib-1759
Contract N00014-67-A-0201-0013, Grant NSF-GA-17386
Availability: Pub. in Limnology and Oceanography, v19 n4 p711-715 Jul 74.

Descriptors: *Salinity, Sea water, Sulfates, Chlorides, Alkalinity, Thermochemistry, Quantitative analysis, Reprints.

Total sulfate, chlorinity, and total alkalinity in seawater solutions have been determined by thermometric titration. The precision of the analyses was 0.3% for sulfate, 0.04% for chlorinity, and 0.1% for total alkalinity. Because of their simplicity, speed, and high precision, thermometric titrations are ideally suited for a wide range of applications in the marine environment (e.g. pore water analysis). Author

N75-26059/8GA PC$5.75/MF$2.25
California Univ., Berkeley. Dept. of Chemical Engineering.
The Synthesis of Higher Oxides of Alkali and Alkaline Earth Metals in an Electric Discharge: Theoretical and Experimental Studies.
Final Report, 1 Jun. 1971 - 31 Aug. 1974.
A. T. Bell, and P. Sadhukhan. 31 Aug 74, 135p NASA-CR-143024
Contract NGR-05-003-462

Descriptors: *Alkali metal compounds, *Alkaline earth metals, *Electric discharges, *Inorganic peroxides, Alkaline earth oxides, Chemical analysis, Peroxides, Thermal stability, Thermogravimetry.

For abstract, STAR 1317

PAT-APPL-497 446/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Preparation of TiO2 and Artificial Rutile from Sodium Titanate.
Patent Application,
John M. Gomes, and Daniel A. O'Keefe. Filed 14 Aug 74, 12p DOCKET/MIN-2252
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Titanium dioxide, *Pigments, Manufacturing, Titanates, Roasting, Sulfuric acid.
Identifiers: *Sodium titanates.

A process is described in which pigment TiO2 is prepared from sodium titanate by mixing with sulfuric acid, calcining at from 600 to above about 900 C, thereafter quenching in water, dissolving out the soluble sodium sulfate and recovering TiO2. By operating at 900 C and above, artificial rutile is obtained. Instead of sulfuric acid, other mineral acids, their anhydrides, ammonium and alkali metal acid salts of said acids and borax may be employed.

PATENT-3 162 603 Not available NTIS
Department of the Army Washington D C
Method of Growing Iridium Substituted Single Crystal Using Bismuth Oxide Flux.
Patent,
Jack A. Kohn, Robert O. Savage, Jr., and Arthur Tauber. Filed 1 Feb 63, patented 22 Dec 64, 2p Rept nos. PAT-APPL-256 221,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Barium oxides, Synthesis(Chemistry), Doping, Iridium, Single crystals, Microwave equipment, Magnetic properties.
Identifiers: PAT-CL-252-62-5.

This invention relates to a method of growing single crystals of the general formula BaFe(12-2x)(Ir(x)Me(x)O19 where Me is a divalent metal from the group cobalt, nickel, magnesium, manganese, iron, zinc, or copper and where x is a number from 0 to 0.6. An object of this invention is to grow single crystals of the above general formula that are mechanically sound, have well developed crystalline faces and are relatively free of pits and foreign inclusions. Another object is to grow single crystals of the above general formula for use in microwave and millimeter device applications as in isolators, rotators, filters, power limiters, and harmonic generators.

PATENT-3 741 727 Not available NTIS
Department of the Army Washington D C
Arsenic Sampler.
Patent,
Howard L. Stroterhoff. Filed 4 Feb 72, patented 26 Jun 73, 3p Rept nos. PAT-APPL-223 513,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Arsenic compounds, Chemical analysis, Samplers, Water pollution, Colors.
Identifiers: PAT-CL-23-230-R, *Water analysis, Spot tests, Water pollution detection.

The patent describes an apparatus and method to indicate the presence of arsenicals in water whereby a sample of water is taken into a clear and flexible plastic tube. A cap having a detection paper impregnated with a mercuric salt mounted in the cap is inserted on to the plastic tube to retain the water sample therein. A sealed thin wall glass ampule fixedly retained in the plastic tube is broken by squeezing the plastic tube at the ampule location and with the ampule between the fingers to release to the water sample a mixture of potassium bisulfate and cupric sulfate contained in the ampule to react with the water sample and any arsenical material therein and a zinc strip within the plastic tube. Any arsenical material present in the water is detected by a yellow to brown color imparted to the detection paper upon reaction of the mercuric salt therein with arsine produced upon release of the ampule contents to the water sample.

7C. Organic Chemistry

AD-A013 763/8GA PC$3.25/MF$2.25
Bristol Univ (England) Dept of Inorganic Chemistry
Synthesis of a Boron Analogue of Co-Ordinated Cyclobutadiene; X-Ray Molecular Structures of Closo- and Nido-L2PtC2B6H6R2,
Michael Green, John L. Spencer, F. Gordon A. Stone, and Alan J. Welch. 29 Jul 74, 4p AFOSR-TR-75-1120
Grant AF-AFOSR-2090-71
Availability: Pub. in Jnl. of the Chemical Society Chemical Communications, p794-795 1974.

Descriptors: *Metalorganic compounds, *Platinum compounds, *Complex compounds, *Organoboranes, *Carboranes, Synthesis(Chemistry), Crystal structure, Organic phosphorus compounds, Reprints.

Reaction of closo-1,6-R2-1,6-C2B6H6 (R = H or Me) with (Pt(trans-stilbene)L2) (L = PEt3 or PMe3) affords closo-(L2PtC2B6H6R6) and nido-(L2PtC2B6H6R2) complexes which are structurally characterised by X-ray crystallography. (Author)

AD-A013 885/9GA PC$3.25/MF$2.25
Pennsylvania State Univ University Park Dept of Chemistry
The Formation and Reactions of Monovalent Carbon Intermediates. III. The Reaction of Carbethoxymethyne with Olefins,
O. P. Strausz, G. J. A. Kennepohl, F. X. Garneau, Thap DoMinh, and B. Kim. 26 Mar 74, 10p
AFOSR-TR-75-1200
Grant AF-AFOSR-1983-71
Availability: Pub. in Jnl. of the American Chemical Society, v96 n18 p5723-5732, 4 Sep 74.

Descriptors: *Organic compounds, *Addition reactions, Photolysis, Free radicals, Carbenes, Olefin polymers, Reprints.

AD-A013 889/1GA PC$3.25/MF$2.25
Sussex Univ Brighton (England) School of Molecular Sciences
Photochemical Synthesis and Electron Spin Resonance Characterisation of Stable Trivalent Metal Alkyls (Si, GE, SN) and Amides (Ge and Sn) of Group IV Elements,
John D. Cotton, Colin S. Cundy, David H. Harris, Andrew Hudson, and Michael F. Lappert. 3 Jun 74, 2p AFOSR-TR-75-1215
Grant AF-AFOSR-2220-72
Availability: Pub. in Jnl. of the Chemical Society, Chemical Communications, p651-652 1974.

Descriptors: *Metalorganic compounds, *Group II-VI compounds, *Amides, *Alkyl radicals, *Photochemical reactions, Electron paramagnetic resonance, Silicon compounds, Germanium compounds, Tin compounds, Synthesis(Chemistry), Reprints.

AD-A013 901/4GA PC$3.25/MF$2.25
Bristol Univ (England) Dept of Inorganic Chemistry
Cyclometallation Reactions. IX. 2-(Phenylazo)phenyl Complexes of Iridium(III),
Michael I. Bruce, Brian L. Goodall, F. Gordon A. Stone, and Bruce J. Thomson. 16 May 74, 5p
AFOSR-TR-75-1121
Grant AF-AFOSR-2090-71
Availability: Pub. in Australian Jnl. of Chemistry, v27 p2135-2138 1974.

Descriptors: *Iridium compounds, Addition reactions, Complex compounds, Chelate compounds, Ligands, Oxidation, Azobenzenes, Organometallic compounds, Metalorganic compounds, Reprints, Great Britain.

Iridium(III) complexes containing chelating 2-(phenylazo)phenyl ligands have been obtained by oxidative addition of azoebenzene or 2-bromozobenzene to (IrCl(CO)(PPh3)2); some reactions of these derivatives are also described. (Author)

AD-A013 902/2GA PC$3.25/MF$2.25
Bristol Univ (England) Dept of Inorganic Chemistry
Metallaborane Chemistry. Part 1. Oxidative-Insertion Reactions of Dicarbaundecaborane and Metalladicarbaundecaborane Species with Zerovalent Nickel, Palladium, and Platinum Complexes,
Michael Green, John L. Spencer, E. Gordon A. Stone, and Alan J. Welch. 1 Jul 74, 8p AFOSR-TR-75-1122
Grant AF-AFOSR-2090-71
Availability: Pub. in Jnl. of the Chemical Society, p178-184 1975.

Descriptors: *Carboranes, *addition reactions, Single crystals, Nickel, Palladium, Platinum, Organoboranes, Organometallic compounds, X ray diffraction, Synthesis, Metalorganic compounds, Chemical reactions, Great Britain, Reprints.

AD-A013 908/9GA PC$3.25/MF$2.25
Bureau of Mines Bartlesville Okla Bartlesville Energy Research Center
Enthalpies of Formation of Cyclopentylamine and Cyclobutylamine: Vapor Pressure of Cyclopentylamine,
William D. Good, John F. Messerly, Ann G. Osborn, and Donald R. Douslin. 11 Jul 74, 9p
Rept no. Contrib-209 AFOSR-TR-75-1143
Availability: Pub. in Jnl. of Chemical Thermodynamics, v7 p285-291 1975.

Descriptors: *Amines, *Thermochemistry, Enthalpy, Heat of formation, Heat of combustion, Heat of vaporization, Vapor pressure, Cyclic compounds, Reaction kinetics, Calorimetry, Reprints.
Identifiers: *Cyclopentylamine, *Cyclobutylamine.

PATENT-3 160 649 Not available NTIS
Department of the Army Washington D C
Synthesis of Methylthiomethyl Isothiocyanate.
Patent,
Torsten Hasselstrom, and Richard C. Clapp.
Filed 2 Feb 61, patented 8 Dec 64, 1p Rept nos. PAT-APPL-86 831,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Thiocyanates, Synthesis(Chemistry).
Identifiers: PAT-CL-260-454, Isothiocyanates, *Isothiocyanic acid/(methyl-ester)-methylthio.

This invention concerns methylthiomethyl isothiocyanate, particularly for use as a synthetic condiment. The authors have succeeded in synthesizing methylthiomethyl isothiocyanate, in spite of the difficult-to-synthesize nature of methylthiomethyl isothiocyanate as a derivative of formic acid. It is a yellow to colorless liquid, having a pleasantly pungent taste and aroma resembling mustard, with a slight peppery accent. Being a chemical relative of mustard oil (allyl isocyanate), it is nonpoisonous to humans and warm-blooded animals.

PATENT-3 856 710 Not available NTIS
Department of Agriculture, Washington, D.C.
Nickel/Copper Chromite Catalysts for Hydrogenating Edible Oils.
Patent,
Karl J. Moulton, and Robert E. Beal. Filed 4 Feb 74, patented 24 Dec 74, 4p* PAT-APPL-438 960,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vegetable oils, *Hydrogenation, *Catalysts, Liquefaction, Copper, Nickel.
Identifiers: PAT-CL-252-470.

Liquid salad and cooking oils can be prepared by winterizing vegetable oils which have been partially hydrogenated with nickel catalysts. Nickel catalysts are rapid, but they are only slightly selective. That is triunsaturated components which are present in many vegetable oils and which have been shown to be responsible for flavor and oxidative instability cannot be completely removed by hydrogenation with nickel catalyst without also undesirably converting significant amounts of the diunsaturated components to monounsaturates and some of the monounsaturated components to saturates. This invention pertains to catalyst compositions which contain both copper and nickel components and which are useful for the selective partial hydrogenation of polyunsaturated vegetable oils.

PATENT-3 870 727 Not available NTIS
Department of Agriculture, Washington, D.C.
Production of Harringtonine and Isoharringtonine.
Patent,
Richard G. Powell, and Cecil R. Smith, Jr. Filed 27 Apr 72, patented 11 Mar 75, 10p PAT-APPL-248 189,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Alkaloids, Drug therapy, Lukemias.
Identifiers: PAT-CL-260-326-5, *Harringtonines, Isoharringtonines.

This invention relates to two novel alkaloids, harringtonine and isoharringtonine, and has their production as its primary object. A secondary object is to provide chemotherapeutic agents for the remission of leukemic tumors. Leukemic mice treated with these compounds show a remarkable increase in survival time over untreated leukemic mice.

7D. Physical Chemistry

A.R.E.A.E.E.-195 PC$4.00/MF$2.25
Atomic Energy Establishment, Cairo (Egypt).
Neutron Activation Analysis of Urinary Calculi.
N. Souka, S. Souka, W. Sanad, and A. A. Abdel-Rassoul. 1974, 17p
U.S. Sales Only.

Descriptors: (*Silver, *Activation analysis), (*Zinc, Activation analysis), (*Selenium, Activation analysis), (*Cobalt, Activation analysis), Calculi, Chemical analysis, Neutron reactions, Quantitative chemical analysis, Trace amounts, Urinary tract.

For abstract, see NSA 32 03, number 05849.

AD-A013 736/4GA PC$5.25/MF$2.25
Science Applications Inc Ann Arbor Mich
High Resolution Spectral Survey of Molecular Absorption in the DF Laser Region - Measurements and Calculations.
Interim technical rept. 1 Aug 74-1 Feb 75,
Douglas Woods, Robert Meredith, Frederick Smith, and Thomas Tuer. Jul 75, 101p RADC-TR-75-180
Contract F30602-75-C-0028, ARPA Order-1279

Descriptors: *Laser beams, *Infrared spectra, *Absorption spectra, Predictions, Deuterium compounds, Nitrogen oxides, Methane, Water vapor, Molecular energy levels, Atmospheres, Attenuation.
Identifiers: *Atmospheric attenuation, Deuterium fluoride, Nitrogen oxide(N2O).

The investigation has a threefold objective: (1) Provide the data base from which predictive laser propagation modeling parameters can be extracted; (2) identify and quantify inadequacies in the current modeling parameters; and (3) determine the sensitivity of altitude and meteorological scaling to the modeling parameters. All three of these objectives are addressed in this interim report. The impact of predictive analysis on temperature and altitude scaling is discussed. The propagation of the P(1)(9) and P(3)(8) DF lines are predicted as specific examples of the nature of the altitude and temperature scaling problem. Also studied

were spectral measurements on HDO, CH4 and N2O. Line absorption are presented and comparisons are made with current predictive calculations (i.e., synthetic spectra). A specific application to P(1)(7) propagation is discussed in the context of the HDO measurements.

AD-A013 740/6GA PC$3.25/MF$2.25
Wisconsin Univ Madison Dept of Chemistry
Autoionization and the Photoelectron Spectra of Oxygen,
James A. Kinsinger, and James W. Taylor. 9 Jan 73, 16p AFOSR-TR-75-1177
Grants AF-AFOSR-1725-69, NSF-GP-36236X
Availability: Pub. in International Jnl. of Mass Spectrometry and Ion Physics, 11 p461-474 1973.

Descriptors: *Oxygen, *Photoelectrons, Peak values, Intensity, Spectroscopy, Ionization, Vacuum ultraviolet radiation, Vibrational spectra, Reprints.
Identifiers: *Rydberg series.

AD-A013 741/4GA PC$3.25/MF$2.25
Wisconsin Univ Madison Dept of Chemistry
Chemical Information from Computer-Processed High Resolution Mass Spectral Data. Correction of Intensities and Conversion from Isotopic Species to Equivalent Chemical Species,
Richard M. Hilmer, and James W. Taylor. 24 Oct 73, 9p AFOSR-TR-75-1180
Grants AF-AFOSR-1725-69, NSF-GP-36236X
Availability: Pub. in Analytical Chemistry, v46 n8 p1038-1044 Jul 74.

Descriptors: *Molecular spectroscopy, Mass spectrometry, High resolution, Isotopes, Chemical composition, Multivariate analysis, Molecular ions, Intensity, Reprints.
Identifiers: Simplex method.

A significant reduction in the number of possible formulas corresponding to peaks in a high-resolution mass spectrum is achieved by converting the isotopic formulas to a single chemically equivalent formula. A weighting factor derived from the correlation of a given formula with the rest of the spectrum is used to delete all but the most significant formulas. For the test cases examined, the odd-electron species with the highest weighting factor has usually been found to correspond to the correct molecular ion, when the molecular ion intensity was greater than the mass spectrometer detection limits. (Author)

AD-A013 742/2GA PC$3.25/MF$2.25
Wisconsin Univ Madison Dept of Chemistry
Instrumental and Numerical Considerations for On-Line Interpretation of High Resolution Mass Spectral Data,
Richard M. Hilmer, and James W. Taylor. 22 Dec 72, 17p AFOSR-TR-75-1182
Grants AF-AFOSR-1725-69, NSF-GP-36236X
Availability: Pub. in Analytical Chemistry, v45 n7 p1031-1045 Jun 73.

Descriptors: *Mass spectrometry, *Data reduction, Mass spectrometers, Data processing, On line systems, Data acquisition, High resolution, Reprints, Digital computers.
Identifiers: Double focusing.

Several important instrumental characteristics of an AEI-MS9 double focusing mass spectrometer in the Nier-Johnson configuration are discussed which influence the choice of techniques for on-line data acquisition and numerical methodology for high resolution mass spectral data processing. The approach described yields an average error of less than 10 ppm in mass measurement, and peaks as small as 0.05% of the tallest peak are observed. Instrument vibration raises the average mass error. Values below 3 ppm are obtained from data where vibration isolation has been attempted. The time of execution of the data reduction is about 3-10 min on the Raytheon 706 computer, and about 15-60 sec per spectrum on the Univac 1108. The computing times depend on the number of multiplet peaks to be deconvoluted, the number of peaks in the spectrum, and the number of atoms allowed in the elemental formulas. (Author)

AD-A013 744/8GA PC$3.25/MF$2.25
Wisconsin Univ Madison Dept of Chemistry
A Photoionization Mass Spectrometer Utilizing a High Intensity Molecular Beam Sampling System and Synchrotron Radiation,
Gary R. Parr, and James W. Taylor. 29 Jun 73, 7p AFOSR-TR-75-1183
Grants AF-AFOSR-1725-69, NSF-GP-36236X
Availability: Pub. in Review of Scientific Instruments, v44 n11 p1578-1583 Nov 73.

Descriptors: *Photoionization, *Mass spectrometers, *Synchrotrons, Molecular beams, Vibration, High intensity, Sampling, Carbon dioxide, Reprints.

A compact photoionization mass spectrometer utilizing a supersonic molecular beam sampling system is described. Beam intensities of the order of 3 x 10 to the 18th power molecules/sr sec are obtained for CO2. The use of this apparatus with synchrotron radiation is discussed. Results are presented for C2H2 and CO2 which indicate the usefulness of the nozzle beam with its attendant thermal relaxation for photoionization mass spectrometry studies. (Author)

AD-A013 746/3GA PC$3.25/MF$2.25
Northwestern Univ Evanston Ill Dept of Physics
Electronic Structure and Fermi-Surface-Related Instabilities in 1T-TaS2 and 1T-TaSe2,
H. W. Myron, and A. J. Freeman. 28 Aug 74, 6p AFOSR-TR-75-1214
Grant AF-AFOSR-2012-71
Availability: Pub. in Physical Review B, v11 n8 p2735-2739, 15 Apr 75.

Descriptors: *Fermi surfaces, Chalcogens, Electron energy, Band theory of solids, Bonding, Physical properties, Sulfides, Reprints.

The electronic-energy-band structure and full-Brillouin-zone Fermi surfaces of the layered dichalcogenides 1T-TaS2 and 1T-TaSe2 have been calculated using the Korringa-Kohn-Rostoker method in the muffin-tin approximation. We find that the Fermi surfaces for both systems away from symmetry points and lines have cross sections which are approximately constant along the z direction. Strong nesting features of the Fermi surface are found for a spanning vector parallel to the Gamma-M direction in reciprocal space with values in good agreement with the charge-density-wave results found by Wilson, Di Salvo, and Mahajan for these compounds. (Author)

AD-A013 818/0GA PC$3.25/MF$2.25
Yale Univ New Haven Conn Dept of Engineering and Applied Science
Electronically Excited Metal Atoms Produced by Chemical Reactions.
Final rept. 1 Jan 74-30 Jun 75,
J. L. Hirschfield. 1975, 10p AFOSR-TR-75-1169
Grant AF-AFOSR-2637-74

Descriptors: *Atoms, Chemical reactions, Excitation, Scientific research, Chemiluminescence.
Identifiers: Dimers.

The report briefly describes research on two types of highly exoergic chemical reactions. These reactions are reactions of metal dimers with halogen atoms and reaction of carbon atoms with metal oxides. Experiments were completed on the reaction of thallium with fluorine. Chemiluminescence was observed both from thallium atoms and electronically excited TlF molecules. Preliminary experiments were also started on the reaction of carbon with metal oxide.

AD-A013 819/8GA PC$3.25/MF$2.25
Yale Univ New Haven Conn Dept of Physics
Theory of Atomic Structure, Electron-Atom and Atom-Atom Scattering with Application to Communications and Lasers.
Final rept. 1 Jun 70-31 Mar 75,
Vernon W. Hughes, and Charles M. Sommerfield. 1975, 17p AFOSR-TR-75-1168
Contract F44620-70-C-0091

Descriptors: *Atomic energy levels, Scientific research, Zeeman effect, Helium, Positronium, Hydrogen.

Very briefly described is research conducted on the following topics: Fine structure and Zeeman effect of helium; Zeeman and Stark effect of positronium; hyperfine structure of the muonic helium atom; Lamb shifts of hydrogenic ions of high Z; nonadiabatic effects in slow atomic collisions; quenching of the metastable 2S state of muonic hydrogen and the muonic helium ion; two photon absorption; and quantization of electrodynamics hyperboloids and generalization of the effective action for electrodynamics.

AD-A013 843/8GA PC$3.25/MF$2.25
Flow Research Inc Kent Wash
Reactions and Electrochemical Kinetics of Newly-Generated Metal Surfaces.
Final scientific rept. 1 May 72-30 Jun 75,
Theodore R. Beck. Jul 75, 22p AFOSR-TR-75-1074
Contract F44620-72-C-0070

Descriptors: *Titanium, *Cracks, *Corrosion, Electrochemistry, Reaction kinetics, Stress corrosion, Surface chemistry, Salts.

Air Force flight vehicles must withstand increasingly complex environmental and operational regimes. Fundamental knowledge of the mechanisms of fatigue and fracture of flight structures is required. This research is related to the understanding of crack propagation, stress corrosion and corrosion fatigue in titanium and other metals. An electrochemical mass transport kinetic (MTK) model was previously formulated by the author to quantitatively describe the electrochemical events in a crack. The research described was done to fulfill the requirement of the model for quantitative data on new titanium surfaces and to develop a general understanding of the kinetics of the repassivation process.

AD-A013 890/9GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind Dept of Chemistry
X-Ray Photoelectron Spectroscopic Binding Energy Shifts Due to Matrix in Alloys and Small Supported Metal Particles,
K. S. Kim, and N. Winograd. 23 Sep 74, 6p AFOSR-TR-75-1158
Grants AF-AFOSR-2238-72, NSF-GP-37017
Availability: Pub. in Chemical Physics Letters, v30 n1 p91-95, 1 Jan 75.

Descriptors: *Photoelectrons, *X ray spectroscopy, *Energy, *Alloys, *Precious metals, Gold, Silver, Platinum, Silicon dioxide, Implantation, Reprints.

Core level binding energies of metals in the following alloys and metal-dispersed or -implanted materials have been studied: Au-Ag, Pt-Ag, Pt-C and Au-SiO2. Their shifts from the binding energies of pure species (referenced to the Fermi level) are interpreted to consist of a matrix shift resulting from differences in crystal

field potential, relaxation energy and work function as well as a chemical shift due to differences in valence electron density. By estimating the matrix shift using implanted Ar in the related pure materials, the chemical shift could be isolated from the observed binding energy shift. In all cases studied, the matrix shift is greater than the chemical shift and its contribution to the binding energy shifts is in the opposite direction. (Author)

AD-A013 891/7GA PC$3.25/MF$2.25
Purdue Univ Lafayette Ind Dept of Chemistry
ESCA Studies of Metal-Oxygen Surfaces Using Argon and Oxygen Ion-Bombardment,
K. S. Kim, W. E. Baitinger, J. W. Amy, and N. Winograd. 1974, 18p AFOSR-TR-75-1159
Grants AF-AFOSR-2238-72, NSF-GH-33574
Availability: Pub. in Jnl. of Electron Spectroscopy and Related Phenomena, v5 p351-367 1974.

Descriptors: *Photoelectrons, *X ray spectroscopy, *Metals, *Oxides, Argon, Oxygen, Ion bombardment, Nickel, Ruthenium, Molybdenum, Reprints.

ESCA has been used to monitor alternations of catalytically and electrochemically important metal-oxygen surfaces following exposure to Ar(+) and O2(+) ion bombardment. This treatment resulted not only in sputtering, but also, in many cases, in reduction to the corresponding metal or lower oxide. A model based on bulk thermodynamic free energy considerations is proposed to explain this phenomenon. We have also exploited this approach to obtain an in-depth concentration profile of various oxidation states of an element, to selectively prepare desired surface oxide compositions, and to aid in interpreting complex O 1s spectra. Results obtained from metal-oxygen surfaces for Ni, Ru and Mo are presented. Ni2O3 and RuO3, which are gross defect structures of the bulk species, are present on NiO and RuO2, respectively, with the former being confined to the surface layers. The MoO2, on the other hand, is covered with a surface layer of MoO3 present as a regular crystal structure. (Author)

AD-A013 949/3GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Auger Spectroscopy Studies of the Oxidation of Amorphous and Crystalline Germanium.
Journal article,
Victor E. Henrich, and John C. Fan. 28 Oct 74, 8p Rept no. JA-4432 ESD-TR-75-198
Contract F19628-73-C-0002
Availability: Pub. in Jnl. of Applied Physics, v46 n3 p1206-1213 Mar 75.

Descriptors: *Germanium, *Metal films, *Oxidation, *Electron spectroscopy, Amorphous materials, Polycrystalline, Single crystals, Sputtering, Electron beams, Ion beams, Etching, Reprints.

Auger-electron spectroscopy and ion-beam etching was used to study the room-temperature oxidation of sputtered and electron-beam-evaporated Ge films. Both amorphous and polycrystalline films were examined, as well as single-crystal Ge. Electron-escape-depth effects were removed by a deconvolution procedure in order to obtain the O distribution function. Large differences of O distribution were found between sputtered and e-beam amorphous films. Sputtered amorphous films oxidize in the same manner as single-crystal Ge, with the O confined to the first 5-10 A of the surface. In e-beam amorphous films, the depth of O penetration is more than 200 A, although the heavily oxidized region is still only 10-12 A thick. Polycrystalline films have heavily oxidized layers 6-9 A thick, with some O present to a depth of 100-200 A. (Author)

AD-A014 019/4GA PC$3.25/MF$2.25
New York Univ N Y Dept of Physics
Theory of Multiphonon Absorption in Crystals: The Wings of Internal Vibrational Modes of Molecular Impurities,
Bernard Bendow, and Chin-Sen Ting. 13 Jan 75, 13p AFCRL-TR-75-0291
Contract F19628-73-C-0100
Availability: Pub. in Physical Review B, v12 n2 p695-705, 15 Jul 75.

Descriptors: *Phonons, Infrared spectroscopy, Impurities, Absorption, Molecular properties, Molecular vibration, Hamiltonian, Reprints.

The correlation-function approach of Bendow, Ying, and Yukon is applied to obtain the multiphonon absorption in the wings of internal modes of impurities in ionic host crystals. Expansion of the interaction potential in powers of displacements is avoided; we thus obtain expressions containing various classes of phonon processes summed to infinite order. Simplified results for the absorption are obtained by averaging over impurity sites, and by utilizing an Einstein model for the lattice. The results imply that the shape of the multiphonon wing is determined largely by the host-lattice density of states and that in typical instances the spectrum will display an exponential-like frequency dependence similar to the intrinsic case. The rate of fall off is determined primarily by the range of the impurity-host interaction potential. Explicit results are obtained for a model of a substitutional point impurity in a diatomic host, and applied to the case of OH(-) in KCl. (Author)

AD-A014 049/1GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Kinetics of Thermal Dissociation of Hydrazine Nitrate,
Yu. I. Rubtsov, and G. B. Manelis. 27 Mar 75, 14p Rept no. FSTC-HT-23-617-75
Unedited trans. of Zhurnal Fizicheskoi Khimii (USSR) v44 n2 p396-400 1970.

Descriptors: *Hydrazine derivatives, *Dissociation, Reaction kinetics, Translations, USSR.
Identifiers: *Hydrazine nitrates.

On a micro-calorimeter in intervals of 194-254C the kinetic reaction of thermal dissociation of hydrazine nitrate has been investigated. The reaction accelerates whereupon the amount of acceleration depends upon m/V. The kinetic parameters of the reaction have been found. It has been demonstrated that the reaction proceeds across the equilibrium dissociation of hydrazine nitrate to hydrazine and nitric acid whereupon with the main reaction there appears catalytical dissociation of hydrazine in the liquid phase.

AE-502 PC$5.75/MF$2.25
Aktiebolaget Atomenergi, Studsvik (Sweden).
Depth Distribution Studies of Carbon, Oxygen, and Nitrogen in Metal Surfaces by Means of Neutron Spectrometry.
J. Lorenzen. Mar 75, 54p
U.S. Sales Only.

Descriptors: (*Carbon, *Nuclear reaction analysis), (*Nitrogen, Nuclear reaction analysis), (*Oxygen, Nuclear reaction analysis), (*Zircaloy, *Chemical analysis), Deuteron reactions, Neutron spectroscopy, Quantitative chemical analysis, Surfaces, Trace amounts, Steels, Zirconium.

For abstract, see NSA 32 03, number 05848.

AERE-C/M-37 PC$4.50/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Use of T.T.a. For the Estimation of Plutonium in Tracer Quantities.
G. N. Walton. Sep 49, 27p
U.S. Sales Only.

Descriptors: (*Plutonium, *Radiochemical analysis), (*Tta, *Solvent properties), Quantitative chemical analysis, Solvent extraction, Trace amounts.

For abstract, see NSA 32 03, number 05907.

ANL-75-24 PC$5.45/MF$2.25
Argonne National Lab., Ill.
Radiochemical Procedures and Techniques.
K. Flynn. Apr 75, 71p
Contract W-31-109-Eng-38

Descriptors: (*Arsenic, *Radiochemical analysis), (*Bromine, Radiochemical analysis), (*Rubidium, Radiochemical analysis), (*Strontium, Radiochemical analysis), Antimony, Barium, Cadmium, Cerium, Cesium, Iodine, Molybdenum, Palladium, Quantitative chemical analysis, Rare earths, Rhodium, Ruthenium, Silver, Tellurium, Tin, Zirconium.

For abstract, see NSA 32 03, number 05908.

BNWL-B-394 PC$5.45/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
In-Situ X-Ray Fluorescence System Design.
H. G. Rieck, J. R. Kosorok, R. W. Perkins, and N. A. Wogman. Apr 75, 13p
Contract AT(45-1)-1830

Descriptors: (*Elements, *X-ray fluorescence analysis), (*Radioisotopes, X-ray fluorescence analysis), (*Sediments, *Chemical analysis), Aquatic ecosystems, Contamination, Distribution, Trace amounts, Water pollution.

For abstract, see NSA 32 03, number 05877.

COM-75-50214-03/GA MF$2.25
National Bureau of Standards, Washington, D.C.
Journal of Research of the National Bureau of Standards: A, Physics and Chemistry. Volume 79A, Number 3, May-June 1975.
1975, 62p JNBAAR-79A(3), NBS-JRA-79A-03
Library of Congress Catalog Card No. 62-37059.
See also rept. no. 2, COM-75-50214-02.
Paper copy available from GPO as C13.22/secA:79/3.

Descriptors: *Thermochemistry, *Chemistry, *Periodicals, Heat of combustion, Fluorine aromatic compounds, Cholesterol, Copper, Atomic spectra.
Identifiers: Benzoic acid/hepta fluoro.

Contents:
The enthalpies of combustion and formation of ortho- and parafluorobenzoic acid;
The enthalpies of combustion and formation of cholesterol (cholest-5-en-3-ol(3 Beta));
The enthalpies of combustion and formation of cholesterol (cholest -5-en-3-ol(3 Beta));
The third spectrum of copper (Cu III);
Publications of the Na
tional Bureau of Standards.

COM-75-50453/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Analytical Fluidic Sampling Systems.
Final rept.,
S. P. Cram, and S. N. Chesler. 1974, 13p
Pub. in Jnl. of Chromatography, v99 p267-279 1974.

Descriptors: *Gas chromatography, *Fluidic logic devices, Samplers, Automatic control.

Identifiers: Reprints.

Fluidic logic sampling systems have been developed for analytical detectors such as the plasma chromatograph and flame ionization detector. Automated systems are reported for gases and vapor-phase samples which are rapid, quantitative and reproducible. Sample modulation systems, multiplexers, parallel-to-serial converters and sequential samplers have been developed which give no leakage or cross talk signals. Other applications in analytical chemistry are proposed.

COM-75-50455/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Measurements of Heat Capacity, Electrical Resistivity and Hemispherical Total Emittance of Two Grades of Graphite in the Range 1,500 to 3,000 K by a Pulse Heating Technique.
Final rept.,
A. Cezairliyan, and F. Righini. 1975, 8p
Sponsored in part by Air Force Office of Scientific Research, Arlington, Va.
Pub. in Revue Internationale des Hautes Temperatures et des Refractaires, v12 n2 p124-131 1975.

Descriptors: *Graphite, Specific heat, Electrical resistivity, Emittance, Thermodynamic properties, High temperature tests.
Identifiers: Reprints, Pyrolytic graphite.

Measurements of heat capacity, electrical resistivity and hemispherical total emittance of Poco and pyrolytic graphites in the temperature range 1,500 to 3,000 K by a sub-second duration pulse heating technique are described. For a given graphite grade, heat capacities of different specimens were in agreement within 0.5%. The difference between the results of the two different grades was about 1.8%; the results of Poco being higher than those of pyrolytic. Electrical resistivity of the Poco graphite was about four times greater than that of pyrolytic graphite (parallel to basal planes). Hemispherical total emittance of Poco graphite was almost twice that of pyrolytic graphite.

COM-75-50456/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Quasielastic Neutron Scattering Study of Ammonium-Ion Reorientations in Ammonium Perchlorate.
Final rept.,
H. J. Prask, S. F. Trevino, and J. J. Rush. 15 May 75, 5p
Pub. in Jnl. of Chemical Physics, v62 n10 p4156-4160, 15 May 75.

Descriptors: *Ammonium perchlorate, *Neutron scattering, Heat of activation.
Identifiers: Reprints.

An investigation of the rotational motion of ammonium ions in NH4C104 is reported. Quasielastic neutron scattering measurements were made on a polycrystalline sample at temperatures between 66 and 150K. The shapes and widths of the quasielastic scattering peaks as a function of momentum transfer are consistent with instantaneous reorientation about the four C3 axes. Residence times are derived as a function of temperature.

COM-75-50457/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
The Infrared Spectrum of Methylenimine.
Final rept.,
Marilyn E. Jacox, and Dolphus E. Milligan. 1975, 24p
Sponsored in part by National Aeronautics and Space Administration, Greenbelt, Md. Goddard Space Flight Center.
Pub. in Jnl. of Molecular Spectroscopy, v56 p333-356 1975.

Descriptors: *Imines, *Infrared spectra, Molecular energy levels.
Identifiers: *Methylenimines, Reprints, Vibrational energy levels.

Eleven isotopic species of methylenimine have been prepared by the mercury-arc photolysis of methyl azide isolated in argon, nitrogen, and carbon dioxide matrices at 4 and 14K. Sufficient concentrations of methylenimine were obtained for identification of all of the vibrational fundamentals except the NH stretching mode. Using a recent ab initio structural calculation for this molecule, it has been possible to derive a set of valence-force potential constants which provide a satisfactory fit to all of the infrared spectroscopic data. The magnitude of the carbon-nitrogen stretching force constant is appropriate for a double bond. The temperature dependence of the thermodynamic properties of methylenimine has also been calculated.

COM-75-50458/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Ion-Molecule Reactions in Ethane.
Final rept.,
S. L. Bennett, S. G. Lias, and F. H. Field. 1972, 8p
Sponsored in part by National Science Foundation, Washington, D.C.
Pub. in Jnl. of Physical Chemistry, v76 n26 p3919-3926 1972.

Descriptors: *Ion bombardment, *Ethane, Ions, Chemical reactions.
Identifiers: Reprints.

The ion-molecule reactions in ethane have been investigated in a mass spectrometer at pressures from 0.1 to 5 Torr and at temperatures ranging from 189 to 410K. The major primary ions, C2H4+, C2H5+ and C2H6+, react with ethane to form the repective addition ions, C4H10+, C4H11+, and (C2H6)2+. Under these conditons, the addition ions dissociate to give all the product ions which have been attributed to reactions of these primary ions in previous studies. The rate constants for disappearance of the primary ions decrease as the temperature is raised. When H2O is added to ethane the ethylene ion is intercepted in a rapid reaction to form the C2H4.H2O+ complex, which reacts further with water to add a second, a third, and a fourth molecule of water.

COM-75-50461/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Viscoelasticity of Dilute Chain-Molecule Solutions: Evaluation of Hydrodynamic Interaction.
Final rept.,
Francis W. Wang. 1975, 17p
Pub. in Jnl. of Polymer Science, Polymer Physics Edition, v13 p1215-1231 1975.

Descriptors: *Polymers, Polystyrene, Viscosity, Deoxyribonucleic acids.
Identifiers: Reprints.

The viscoelastic properties of chain molecules varying in flexibility and length have been calculated by use of the bead-spring model theory of Zimm. In the evaluation of the hydrodynamic interaction parameter, the number of springs in the bead-spring model, N, has been selected from the range in which the properties predicted by the theory are insensitive to the value of N. The results for limiting viscosity number agree with those predicted by the Yamakawa-Fujii theory of the limiting viscosity number of wormlike chains. The theory also fits the experimental data of Johnson on a sample of polystyrene of molecular weight 860,000 in theta solvents at infinte dilution. The viscoelastic properties of some moderate-molecular-weight deoxyribonucleic acid solutions are predicted to deviate from the non-free-draining behavior toward the free-draining behavior.

COM-75-50467/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Defect-Complex Reorientation Processes in GdF3-Doped CaF2.
Final rept.,
A. D. Franklin, J. M. Crissman, and K. F. Young. 1975, 23p
Pub. in Jnl. of Physics C, v8 p1244-1266 1975.

Descriptors: *Gadolinium, Calcium fluorides, Ions, Crystal lattice defects.
Identifiers: Reprints, *Electron paramagnetic resonance, Gadolinium fluorides, Line broadening, Doping.

Measurements are reported of the temperature dependence of EPR lifetime broadening in the spectrum of Gd(3+) ions in tetragonal sites in CaF2, and of dielectric and anelastic relaxation in similar specimens. Concentrations ranged from 0.01 to 0.27 mole percent GdF3, and the crystals were annealed in flowing He + HF at various temperatures. The strongest relaxation modes (R(I)) arising from pairs formed from Gd(3+) ions plus trapped F(-) interstitials could be identified in both the dielectric (T(Iu)) and the anelastic (E(g)) spectra.

COM-75-50468/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Mean Life of the 5p doublet P(3/2) Resonance Level in Ag(I).
Final rept.,
Jules Z. Klose. 15 May 75, 5p
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.
Pub. in Astrophysics Jnl., v198 p229-233, 15 May 75.

Descriptors: *Silver, Ions, Atomic energy levels, Electron transitions, Relaxation time.
Identifiers: Reprints.

The mean life of the 5p doublet P(3/2) resonance level in Ag I has been measured at two different vapor densities using electronic excitation and a method of delayed coincidence. The lifetime values, obtained by optically detecting the decay of the 5p doublet P(3/2) to 5s doublet S(1/2) (3280.68 A) resonance transition, increase with increasing vapor density. This vapor density dependence was interpreted as being due to the imprisonment of the 3281 A resonance radiation. The Holstein theory of the imprisonment of resonance radiation was applied to the lifetime-versus-vapor density data. Experimental results of other workers are presented for comparison with the results of the present work.

CONF-750511-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Magnetic Circular Dichroism of Defects.
F. A. Modine, R. W. Major, and T. M. Wilson. 1975, 5p

Descriptors: (*Magnesium oxides, *Dichroism), (*Calcium oxides, Dichroism), (*Strontium oxides, Dichroism), (*Barium oxides, Dichroism), Faraday method, Magnetic properties, Zeeman effect.

For abstract, see NSA 32 03, number 06955.

CONF-750603-2 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.

Environmental and Fuel Materials Analyses by Multi-Element Isotope Dilution Spark-Source Mass Spectrometry.
J. A. Carter, D. L. Donohue, J. C. Franklin, and R. W. Stelzner. 1975, 12p

Descriptors: (*Water, *Mass spectroscopy), (*Gasoline, Mass spectroscopy), Accuracy, Isotope dilution, Multi-element analysis, Sensitivity.

For abstract, see NSA 32 03, number 05880.

CONF-750607-10 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Fate of Aliphatic Compounds in Nitric Acid Processing Solutions.
W. E. Clark, and W. B. Howerton. 1975, 10p

Descriptors: (*Nitric acid, *Chemical reactions), (*Iodinated aliphatic hydrocarbons, Chemical reactions), (*Nitric acid esters, Chemical reactions), (*Acetic acid, Chemical reactions), Carboxylic acids, Iodic acid, Malonic acid, Oxalic acid, Succinic acid.

For abstract, see NSA 32 03, number 05961.

COO-2326-9 PC$4.00/MF$2.25
Iowa Univ., Iowa City Dept. of Chemistry.
High-Intensity Superthermal Source of Hydrogen Atoms.
K. R. Way, S. C. Yang, and W. C. Stwalley. 1975, 4p CONF-750705-2

Descriptors: (*Hydrogen, *Atomic beams), Flux density, Operation, Temperature dependence.

For abstract, see NSA 32 03, number 07401.

COO-3498-23 PC$5.50/MF$2.25
Rochester Univ., N.Y. Dept. of Chemistry.
Phase Equilibrium Isotope Effects in Molecular Solids and Liquids.
Y. Yato, M. W. Lee, and J. Bigeleisen. 1971, 50p
Contract AT(11-1)-3498

Descriptors: (*Oxygen 18, *Isotope effects), (*Nitrogen 15, Isotope effects), Liquids, Low temperature, Nitrogen oxides, Solids, Vapor pressure.

For abstract, see NSA 32 03, number 05972.

CRN-CNPA-74-26 PC$4.25/MF$2.25
Centre National de la Recherche Scientifique, 67 - Strasbourg (France). Centre de Recherches Nucleaires.
Energy Loss of Heavy Ions in Nuclear Collisions in Silicon.
J. J. Grob, A. Grob, A. Pape, and P. Siffert. 1974, 25p
U.S. Sales Only.

Descriptors: (*Silicon, *Collisions), (*Nitrogen, Collisions), Cations, Energy dependence, Energy losses, Heavy ions, Ion collisions, Kev range 100-1000, Mev range 01-10, Nitrogen 14, Silicon 28.

For abstract, see NSA 32 03, number 07452.

DEMO-74/15 PC$4.75/MF$2.25
Democritus Nuclear Research Center, Athens (Greece).
Actanal: A Comprehensive Computer Program for Routine Activation Analysis Using Ge(Li) Detectors.
W. Bock-Werthmann, G. Papakostidis, A. P. Grimanis, J. Petrou, and D. Georghiou. Dec 74, 33p
U.S. Sales Only.

Descriptors: (*Activation analysis, *Data processing), (*Computer codes, *A codes), Li-drifted ge detectors, Neutron reactions.

For abstract, see NSA 32 03, number 05852.

EUR-5282e PC$5.00/MF$2.25
Commission of the European Communities, Ispra (Italy). Joint Research Centre.
Determination of 25 Elements in Biological Standard Reference Materials by Neutron Activation Analysis.
G. Guzzi, R. Pietra, and E. Sabbioni. 1974, 38p
U.S. Sales Only.

Descriptors: (*Arsenic, *Activation analysis), (*Cadmium, Activation analysis), (*Calcium, Activation analysis), (*Chlorine, Activation analysis), Chemical analysis, Neutron reactions, Quantitative chemical analysis, Trace amounts, Cesium, Chromium, Cobalt, Copper, Gallium, Iron, Leaves, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Rubidium, Selenium, Silicon, Sodium, Strontium, Zinc, Barium, Lanthanum, Liver, Scandium.

For abstract, see NSA 32 03, number 05853.

INT-65/C PC$4.00/MF$2.25
Institute of Physics and Nuclear Techniques, Krakow (Poland).
Investigations of the Mechanism of the Scale Growth on Iron in Atmosphere of Sulphur Dioxide.
J. Gilewicz-Wolter. 1975, 18p
In Polish. U.S. Sales Only.

Descriptors: (*Iron, *Scaling), (*Sulfur oxides, *Chemical reactions), Chemical reaction kinetics, High temperature, Sulfur 35, Tracer techniques.

No abstract available.

ITF-74-147P PC$4.75/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Effective Interactions in Groups of Neutral Identical Atoms Containing Excited Ones.
I. R. Yukhnovskii, and R. N. Kadobyanskii. 1974, 32p
In Russian. U.S. Sales Only.

Descriptors: (*Atoms, *Configuration), Atom-atom collisions, Dipoles, Energy dependence, Energy levels, Exchange interactions, Excited states, Ground states, Parity, Resonance, Symmetry.

No abstract available.

JUL-1156 PC$8.00/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorwerkstoffe und Heisse Zellen.
Droplet Model of Pyrocarbon Deposition from the Gas Phase.
J. Linke, K. Koizlik, H. Luhleich, and H. Nickel. Jan 75, 98p
In German. U.S. Sales Only.

Descriptors: (*Carbon, *Chemical vapor deposition), Chemical reaction kinetics, Gases, Hydrocarbons, Pyrolysis, Structural models.

No abstract available.

MLM-2198 PC$5.45/MF$2.25
Mound Lab., Miamisburg, Ohio.
Mound Laboratory Activities for the Division of Physical Research: July--December 1974.
10 Apr 75, 69p
Contract AT-33-1-GEN-53

Descriptors: (*Isotope separation, *Research programs), (*Deuterium, Research programs), (*Hydrides, Research programs), (*Separation processes, Research programs).

No abstract available.

NBL-274 PC$5.45/MF$2.25
Energy Research and Development Administration, New Brunswick, N.J. New Brunswick, Lab.
Results of the General Analytical Evaluation Program for Uranium Hexafluoride, Phase I.
C. D. Bingham, and J. T. Bracey. May 75, 83p

Descriptors: (*Uranium hexafluoride, *Chemical analysis), (*Uranium 235, Chemical analysis), Comparative evaluations, Isotope ratio.

For abstract, see NSA 32 03, number 05881.

NIM-1689 PC$4.00/MF$2.25
National Inst. for Metallurgy, Johannesburg (South Africa).
Determination, by Atomic-Absorption Spectrophotometry, of Arsenic, Selenium, Tellurium, Antimony, and Bismuth on Ion-Exchange Resins.
K. Dixon, R. C. Mallett, and R. Kocaba. 15 Mar 75, 12p
U.S. Sales Only.

Descriptors: (*Arsenic, *Absorption spectroscopy), (*Selenium, Absorption spectroscopy), (*Tellurium, Absorption spectroscopy), (*Antimony, Absorption spectroscopy), Accuracy, Bismuth, Ion exchange materials, Nitric acid, Quantitative chemical analysis, Resins.

For abstract, see NSA 32 03, number 05882.

N75-26057/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Exploring the Cell: Sodium (Beta-Alumina) Cupric Chloride - Aluminum Chloride - Sodium Chloride Between 136 and 200 C.
R. O. Miller. Jun 75, 14p NASA-TM-X-3245, E-8189

Descriptors: *Aluminum chlorides, *Copper chlorides, *Electrochemical cells, *Molten salt electrolytes, *Sodium chlorides, Aluminum oxides, Catholytes, Electric discharges, Electric potential, Electrical resistance, Electrolytic polarization.

For abstract, STAR 1317

N75-26062/0GA PC$3.25/MF$2.25
Case Western Reserve Univ., Cleveland, Ohio. Electrochemistry Research Lab.
Catalysts for Electrochemical Generation of Oxygen.
Semiannual Status Report, 1 Oct. 1974 - 31 Mar. 1975.
W. E. Ogrady, and J. Huang. 31 Mar 75, 16p
NASA-CR-143061, SASR-6
Contracts NGR-36-027-050, NGR-36-027-052

Descriptors: *Electrocatalysts, *Electrochemistry, *Gas evolution, *Oxygen, Anions, Anodes, Atomic structure, Electrokinetics, Microelectronics, Platinum.

For abstract, STAR 1317

N75-26302/0GA PC$3.75/MF$2.25
Southern Univ., Baton Rouge, La. Dept. of Physics.
Shock Wave Structure in an Ideal Dissociating Gas.
Annual Progress Report.
K. H. Liu. 1975, 47p NASA-CR-142985
Contract NGR-19-005-003

Descriptors: *Chemical reactions, *Gas dissociation, *Molecular structure, *Shock layers, Gas dynamics, Mathematical models.

For abstract, STAR 1317

N75-26823/5GA PC$4.75/MF$2.25
Amsterdam Univ. (Netherlands).
Energy Distributions of Sputtered Neutrals and Electron Transfer and Reactive Ionization in Atom-Molecule Collisions.
Ph.D. Thesis.
G. P. Koennen. 18 Sep 74, 100p

Descriptors: *Atomic collisions, *Electron transfer, *Energy distribution, *Molecular collisions, Atomic beams, Neutral particles, Sputtering, Surface ionization.

For abstract, STAR 1317

PATENT-3 167 383 Not available NTIS
Department of the Army Washington D C
Method of Producing Pure Single Crystals of Graphite.
Patent,
Armando A. Giardini, and John E. Tydings. Filed 5 Apr 62, patented 26 Jan 65, 2p Rept nos. PAT-APPL-185 483,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Graphite, *Single crystals, *Patents, Fused salts, Dissolving.
Identifiers: PAT-CL-23-209-1.

The patent consists essentially of dissolving carbon under conditions of high pressures and high temperatures in a suitable-non-metallic solvent. Solution of carbon is carried out in a fused salt, or mixture of salts, to a state of saturation. The solution is thereupon cooled (while maintaining elevated pressure) to induce precipitation of free carbon, which recrystallizes as crystals of graphite. The temperature of the reaction is then reduced to normal, followed by lowering of pressure to normal. Therefore a method whereby carbonaceous materials may be converted to graphite crystals of high quality is provided.

PATENT-3 826 971 Not available NTIS
Department of the Interior, Washington, D.C.
Determination of Sulfate Using Ferric Ion-Selective Electrode.
Patent,
Raymond J. Jasinski, and Isaac Trachtenberg.
Filed 12 Apr 73, patented 30 Jul 74, 4p PAT-APPL-350 444,
Supersedes PB-220 443. Also available as report no. DOCKET/SAL-1991.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Sulfates, Potentiometric analysis, Electrodes.
Identifiers: PAT-CL-204-1-T, *Ion selective electrodes.

It has been found, according to the process of the invention, that sulfate ion may be detected or measured in aqueous solution by means of an indirect process that is free of most of the prior art limitations. This process involves (1) addition to the test solution, i.e., the solution whose sulfate ion content is to be measured, of a known concentration of ferric ion, (2) adjustment of the pH of the test solution to a value of about 1.5 to 3, preferably about 2, and (3) measurement of the resulting activity of the ferric ion in the solution by means of a ferric ion-selective sensor.

PB-243 132/8GA PC$5.25/MF$2.25
Missouri Univ., St. Louis. Dept. of Physics.
Portable Device for the Quantitative Determination of Trace Elements in Water in the Sub-Nano Gram Sensitivity Range.
Completion rept.,
Charles C. Foster, and Robert Hight. 18 Apr 75, 111p* W75-09126, OWRT-A-064-MO(2)
Contracts DI-14-31-0001-3825, DI-14-31-0001-4025

Descriptors: *Trace elements, *Water analysis, *Microanalysis, *X ray fluorescence, *Spectrochemical analysis, *Water pollution detection, Metals.

Alpha particles and protons from charged particle accelerators and photons from both x-ray tubes and radioactive sources have been shown to be useful for the excitation of characteristic x-rays for multi-element energy dispersive trace analysis of environmental samples to the few ppm range. The use of 4.5 MeV alpha particles from a thin window Po-210 source (tl/2=138.4d) of 5 mCi effective strength to directly excite x-rays from trace elements in 1 cc water samples. Minimum detectable amounts (MDA's) were established for 20 elements (22<Z<82) using K-, L- and M- radiation and 50 minute counting times. Radioalpha induced x-ray trace element analysis offers the same advantages of portability, ease of operation, low maintenance and cost, and 'in house' availability as radio-photon induced analysis. Because of the availability of more intense sources (up to 10 Ci), the fact that the detected radiation (x-rays) differs from the excitation radiation (alpha-particles) and that K, L, and M x-ray emission cross sections depend essentially only on the emitted x-ray energy, lower MDA's are obtainable for many elements in thin samples for comparable counting times, as well.

PB-243 362/1GA PC$5.25/MF$2.25
Langston Labs., Inc., Leawood, Kans.
Development of Sampling Procedures for Polycyclic Organic Matter and Polychlorinated Biphenyls.
Final rept.,
T. S. Hermann. Aug 74, 110p EPA/650/2-75/007
Contract EPA-68-02-1255

Descriptors: *Pyrenes, *Samples, *Particles, *Air pollution sampling, *Polycyclic compounds, *Gas sampling, Chlorine aromatic compounds, Gas chromatography, Gas analysis.
Identifiers: *Biphenyl/chloro, Benzopyrenes, Stationary sources, Carcinogens, Impingers.

After a review of the most promising sampling trains for collecting PCB, BAP and other POM from stationary sources, a decision was made to evaluate the EPA Method 5 train, a train with a cartridge filter and a train developed by Hangebrauck, Von Lehmden and Meeker. Arochlor 1242, pyrene, anthracene, benzo (alpha) pyrene, benzo (alpha) anthracene and coronene were selected to determine collection efficiencies. Based on the results from laboratory evaluations, a modified train was developed and subjected to further studies. The results of critical laboratory and field experiments indicate the sampling train developed on this program could be used to efficiently and conveniently collect BAP, POM, and PCB's simultaneously. In the field studies POM materials were detected, identified and quantified in emissions from several stationary sources, including incinerators, a coal burning steam generating plant and a charcoal burning restaurant.

PB-243 704/4GA PC$3.25/MF$2.25
Bureau of Mines, Albany, Oreg. Albany Metallurgy Research Center.
Thermodynamic Data for Mg(OH)2(Brucite).
Rept. of investigations 1974,
E. G. King, M. J. Ferrante, and L. B. Pankratz. Jun 75, 19p BuMines-RI-8041

Descriptors: *Magnesium hydroxides, *Thermodynamic properties, *Enthalpy, *Entropy, Free energy, Specific heat, Heat of formation, Extractive metallurgy, Gibbs free energy.
Identifiers: *Brucite.

Enthalpy increments above 198 K were determined by the Bureau of Mines for Magnesium hydroxide (brucite) between 298 and 900 K by the method of drop calorimetry. Enthalpy and entropy increments from this investigation were combined with other data from the literature to calculate absolute entropies, free energy functions, and enthalpies of formation, Gibbs energies of formation, and equilibrium constants of formation from 298 to 900 K by the use of published P-V-T data for water, a table of Gibbs energy change was given for the reaction MgO (periclase) + H2O = Mg(OH)2(brucite) as a function of temperature and pressure.

RD/B/N-3234 PC$5.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Assessment of Methods for the Detection and Spatial Localisation of Radioactive Particles.
P. J. Darley. Nov 74, 37p
U.S. Sales Only.

Descriptors: (*Beta sources, *Electron microscopy), Autoradiography, Beta detection, Electron scanning, Particle size, Radiation monitoring, Scintillation counters, Scintillation counting, Spatial resolution.

For abstract, see NSA 32 03, number 05910.

SGAE-2312 PC$4.00/MF$2.25
Oesterreichische Studiengesellschaft fuer Atomenergie G.m.b.H., Seibersdorf. Inst. fuer Strahlenschutz.
Extraction-Chromatographic Separation of Radiostrontium and Radioyttrium.
H. Sorantin, and A. Jettmar. Jul 74, 13p
In German. U.S. Sales Only.

Descriptors: (*Strontium, *Extraction chromatography), (*Yttrium, Extraction chromatography), Acetone, Hdehp, Hydrochloric acid, Toluene.

For abstract, see NSA 32 03, number 05938.

SGAE-2368 PC$4.25/MF$2.25
Oesterreichische Studiengesellschaft fuer Atomenergie G.m.b.H., Seibersdorf. Inst. fuer Strahlenschutz.
Electrolytic Preparation of Calibration Samples in alpha Spectrometry.
K. Irlweck, and H. Sorantin. Nov 74, 21p
In German. U.S. Sales Only.

Descriptors: (*Plutonium, *Electrodeposition), (*Uranium, Electrodeposition), (*Neptunium, Electrodeposition), (*Americium, Electrodeposition), Alpha spectroscopy, Calibration standards, Sample preparation.

For abstract, see NSA 32 03, number 05911.

Y-DD-173 PC$5.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Uranium in Vivo Spectrometry.
L. M. Scott, and C. M. West. 1975, 36p CONF-750445-4
Contract W-7405-eng-26

Descriptors: (*Uranium, *Whole-body counting), (*Lungs, *Radionuclide kinetics), Depleted uranium, Enriched uranium, Errors, Gamma spectroscopy, In vivo.

For abstract, see NSA 32 03, number 05912.

Y-1966 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Spark Spectrographic Characterization of Uranium Metal by Part Surface Sensitization.
H. G. King. 29 May 75, 19p
Contract W-7405-eng-26

Descriptors: (*Uranium, *Emission spectroscopy), Chemical analysis, Metals, Quality control, Sensitivity, Surfaces.

For abstract, see NSA 32 03, number 05883.

7E. Radio and Radiation Chemistry

BMFT-FBK-75-02 PC$4.25/MF$2.25
Technische Hochschule Aachen (F.R. Germany). Inst. fuer Technische Chemie und Petrolchemie.
Radiation Chemical Addition of Formamide to alpha -Olefins.
B. Dederichs, A. Saus, and H. Siebertz. Mar 75, 23p
In German. U.S. Sales Only.

Descriptors: (*Formamide, *Chemical radiation effects), (*Alkenes, Chemical radiation effects), Polymerization, Quantity ratio, Temperature dependence, Time dependence.

For abstract, see NSA 32 03, number 05992.

BMFT-FBK-75-03 PC$5.50/MF$2.25
Technische Hochschule Aachen (F.R. Germany). Inst. fuer Technische Chemie und Petrolchemie.
Radiation-Initiated Telomerisation of Formic Acid Amide and Ethylene.
B. Dederichs, A. Saus, and H. P. Rath. Mar 75, 46p
In German. U.S. Sales Only.

Descriptors: (*Formamide, *Chemical radiation effects), (*Ethylene, Chemical radiation effects), G value, Gamma radiation, Photon beams, Pressure dependence, Telomerization.

For abstract, see NSA 32 03, number 05993.

BNL-19843 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Thermal Decomposition of Ammonium Perchlorate During gamma-Ray Irradiation.
G. E. Fuller, and P. W. Levy. 1975, 8p CONF-750703-5

Descriptors: (*Ammonium compounds, *Chemical radiation effects), (*Perchlorates, Chemical radiation effects), Crystals, Gamma radiation, Powders, Propellants, Pyrolysis.

For abstract, see NSA 32 03, number 05994.

BNWL-SA-5375 PC$4.50/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Isotopic Composition and Radiological Properties of Uranium in Selected Fuel Cycles.
R. M. Fleischman, and R. C. Liikala. Apr 75, 28p CONF-750445-5

Descriptors: (*Uranium, *Health hazards), (*Pwr type reactors, *Fuel cycle), (*Bwr type reactors, Fuel cycle), (*Htgr type reactors, Fuel cycle), Isotope separation, Lmfbr type reactors, Ore processing, Plutonium, Radioactive wastes, Reprocessing, Spent fuels, Toxicity.

For abstract, see NSA 32 03, number 06044.

CEA-R-4659 PC$9.25/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
Experimental Investigation by Positron Annihilation of Electron Momentum Distributions in Magnesium Oxide and Silicium and Comparison with Compton Scattering.
A. Haulbert. Apr 75, 122p
In French. U.S. Sales Only.

Descriptors: (*Positrons, *Annihilation), (*Magnesium oxides, Positrons), (*Silicon, Positrons), Angular correlation, Brillouin effect, Compton effect, Distribution, Electrons, Lifetime, Linear momentum, Monocrystals, Probability.

For abstract, see NSA 32 03, number 07427.

COO-3035-2 PC$9.50/MF$2.25
Drexel Univ., Philadelphia, Pa.
Radiation Crosslinking of Polymers with Segregated Metallic Particles. Final Report, June 1, 1971--September 30, 1973.
R. D. Corneliussen, I. Kamel, and R. P. Kusy. 1973, 127p
Contract AT(11-1)-3035

Descriptors: (*Polymers, *Chemical radiation effects), (*Metals, Chemical radiation effects), Acrylic acid, Composite materials, Cost, Crosslinking, Fibers, Fillers, Graft polymers, Polymerization, Powders, Research programs.

For abstract, see NSA 32 03, number 05995.

COO-3373-18 PC$5.00/MF$2.25
New England Inst., Inc., Ridgefield, Conn.
Positronium Chemistry. Final Report, February 1966--January 1975.
S. J. Tao. 1975, 39p
Contract AT(11-1)-3373

Descriptors: (*Positronium, *Research programs).

For abstract, see NSA 32 03, number 07430.

COO-3569-4 PC$4.50/MF$2.25
Worcester Polytechnic Inst., Mass.
Gas Phase Radiolysis and Vacuum Ultraviolet Photolysis of Heterocyclic Organic Compounds. Progress Report, February 1, 1974--February 1, 1975.
A. A. Scala, D. Salomon, I. Colon, and J. D'Angona. 1975, 26p
Contract AT(11-1)-3569

Descriptors: (*Furans, *Photolysis), (*Amines, *Radiolysis), (*Pyrrolidines, Radiolysis), (*Piperidines, Radiolysis), Chemical reaction kinetics, G value, Gamma radiation, Organic sulfur compounds, Pressure dependence.

For abstract, see NSA 32 03, number 05996.

JINR-P6-8651 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Chemical States of Radioactive Lanthanide Atoms in PR and Nd Fluorinated beta-Diketonates.
I. I. Gromova, N. G. Zaitseva, Kh. M. Islamova, and N. A. Lebedev. 1975, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Praseodymium 138, *Chemical state), (*Neodymium 139, Chemical state), (*Lanthanum 132, Chemical state), (*Cerium 132, Chemical state), Acetylacetone, Cerium 135, Mev range 100-1000, Neodymium complexes, Praseodymium complexes, Proton beams.

For abstract, see NSA 32 03, number 06040.

PB-243 599/8GA PC$3.25/MF$2.25
Maine Univ., Orono.
Photochemical Oxidation of Kraft Air Pollutants.
Final rept.,
Michael D. Bentley. May 75, 17p EPA/650/3-75/005
Grant EP-800209

Descriptors: *Photochemical reactions, *Organic sulfides, Air pollution, Pulp mills, Sulfate pulping, Oxidation reactions.
Identifiers: Methane thiols, Disulfide/dimethyl, Thiols.

The photolysis of methyl mercaptan, dimethyldisulfide, and methylmethanethiolsulfonate were studied. The photolysis of methyl mercaptan in air was shown to yield dimethyl disulfide, methanesulfonic acid, ethyl mercaptan, methanol, formic acid, methane, sulfur trioxide, and sulfur dioxide in addition to other presently unidentified compounds. The photolysis of dimethyldisulfide in air was shown to yield methanesulfonic acid, methylmethanethiolsulfonate, methanesulfinic acid, methyl formate, sulfur, sulfur dioxide, sulfur trioxide, and other presently unidentified compounds. The photolysis of methylmethanethiolsulfonate in tetrahydrofuran resulted in formation of methane, methyl mercaptan, dimethyl sulfide, dimethyldisulfide, methanesulfinic acid, methanesulfonic acid, and sulfur dioxide. N-isopropyl-S-benzylsulfenamide was found to undergo an unusual thermal elimination to form N-isopropylbenzaqlimine. Lithium amides were found to form sulfenamides upon reaction with disulfide.

SAAS-171 PC$4.50/MF$2.25
Staatliches Amt fuer Atomsicherheit und Strahlenschutz, Berlin (German Democratic Republic).
Reports of the State Ministries for Atomic Safety and Radiation Protection of the Ddr.
Nov 74, 30p
In German. U.S. Sales Only.

Descriptors: Decontamination, German democratic republic, Leading abstract, Radiation protection, Transport.

For abstract, see NSA 32 03, number 06054.

SGAE-2272 PC$5.75/MF$2.25
Oesterreichische Studiengesellschaft fuer Atomenergie G.m.b.H., Seibersdorf. Inst. fuer Chemie.
Radiation Crosslinking of Stabilized Polyethylenes for the Preparation of Extremely Change-Resistant Profiles. First Phase.
R. Schaudy, H. Hubeny, E. Schmitz, E. Proksch, and S. Schrott. Apr 74, 51p
In German. U.S. Sales Only.

Descriptors: (*Polyethylenes, *Chemical radiation effects), Cross-linking, Electron reactions, Mechanical properties.

For abstract, see NSA 32 03, number 05997.

SGAE-2305 PC$4.25/MF$2.25
Oesterreichische Studiengesellschaft fuer Atomenergie G.m.b.H., Seibersdorf. Inst. fuer Chemie.
Radiation-Chemical Crosslinking of Polyethylenes.
R. Schaudy. Jul 74, 23p
In German. U.S. Sales Only.

Descriptors: (*Polyethylenes, *Chemical radiation effects), Cross-linking, Electrical properties, Mechanical properties, Reviews, Solubility.

For abstract, see NSA 32 03, number 05998.

TID-26777 PC$8.00/MF$2.25
New York Univ., N.Y. Dept. of Physics.
Interaction of Radiation with Matter. Progress Report, August 1, 1974--July 31, 1975.
Mar 75, 100p

Descriptors: (*Radiation chemistry, *Research programs), (*Tetracene, *Chemical radiation effects), (*Anthracene, Chemical radiation effects), (*Dna, Chemical radiation effects), Alpha particles, Charge exchange, Energy transfer, Luminescence, Proteins.

For abstract, see NSA 32 03, number 05999.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

AD-A013 636/6GA PC$4.75/MF$2.25
Naval Undersea Center San Diego Calif
FASOR II: Correlative Biological and Acoustical Studies in the North Pacific Ocean.
Interim technical rept.,
Peter F. Seligman, and William A. Friedl. Jan 75, 98p Rept no. NUC-TP-448

Descriptors: *Marine biology, *Acoustic scattering, *North Pacific Ocean, Underwater sound, Sonar echoes, Underwater sound signals, Deep water, Very low frequency, Acoustic measurement, Sonar equipment, Correlation techniques, Acoustic signatures.
Identifiers: FASOR(Forward Area Sonal Research), Forward area sonar research, Deep scattering layers.

An experimental analysis of acoustic and biological measurements collected during a Forward Area Sonar Research (FASOR) Cruise in the North Pacific Ocean (Feb. through Jul. 1966) is presented. Specifically, the relationship among biological samples, acoustical phenomena of echo groups, 12 kHz scattering layers, and 3 and 12 kHz volume scattering measurements, and water mass characteristics is investigated. Studies delineate eight oceanic regions as distinctive in biological and acoustic character (signature). General results are discussed.

8B. Cartography

AD-A013 977/4GA PC$3.75/MF$2.25
Army Engineer Topographic Labs Fort Belvoir Va
Automatic Type/Symbol-Placement Developments.
Technical rept. Oct 71-Nov 73,
John H. Garlow. Mar 75, 34p Rept no. ETL-TR-74-9

Descriptors: *Mapping, *Computer applications, Plotters, Cathode ray tube screens, Computer programming, FORTRAN, Character recognition.
Identifiers: CDC 6600 computers, UNIVAC 1108 computers, IBM 360 computers, Computer aided mapping.

This report covers current efforts, including both in-house and contracted work, by the Automated Cartography Branch of the U.S. Army Engineer Topographic Laboratorics (USAETL) toward development of an automated type/symbol-placement system for the production of topographic maps. Investigations into computer generated type and plotting methods are reported in six categories: (1) Hershey Typographic System; (2) mechanical plotter with Cathode Ray Tube (CRT) plotting head; (3) electron beam recording; (4) raster drum-scanner/plotter approach; (5) digital editing equipment; and (6) digital type/symbol-font acquisition.

E75-10348 PC$3.25/MF$2.25
Geological Survey, Reston, Va.
Urban and Regional Land Use Analysis: CARETS and Census Cities Experiment Package.
Monthly progress rept.,
Robert Alexander, Harry F. Lins, Jr., and Daniel B. Gallagher. 25 Feb 75, 16p NASA-CR-143150
Contract NASA-Order-T-5290-B

Descriptors: Regional planning, Land use, Cities, EREP, Skylab program, Multispectral band scanners, Pulse code modulation, Meteorology.

The author has identified the following significant results. Temperatures in degrees Celsius were derived from PCM counts using the Pease's modified gray window technique. The Outcalt simulator was setup on the USGS computer. The input data to the model are basically meteorological and geographical in nature. The output data is presented in three matrices.

E75-10353 PC$4.25/MF$2.25
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
A Study of Atmospheric Effects on Pattern Recognition Devices.
Final rept.,
Fred Thomson, and F. G. Sadowski. Jul 75, 66p
ERIM-193300-62-F NASA-CR-143155
Contract NAS5-21783
Original contains color illustrations. Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Sacramento Valley(CA), Pattern recognition, Forests, Grasslands, Rocks, Water, Snow, Atmospherics, Earth resources program, Mapping.

The author has identified the following significant results. ERTS-1 imagery can be applied in the broadscale assessment of forest resources as a supplement to aerial photography and field survey. There was not application to inventory of crop and pasture diseases mainly because of poor quality and low resolution, and unreliability of image acquisition. Inventory of soil erosion was satisfactory in humid eastern New South Wales, but not in semi-arid areas. Patterns of snow cover, areas of water in natural and artificial water bodies, extent of bushfires, and location of coastal mobile sand bodies were readily apparent. ERTS-1 imagery was judged to be a valuable addition to conventional techniques of regional small scale geological mapping. ERTS data was successfully used to map flooding and flood progression. The imagery was found suitable for mapping at 1:1,000,000 scale both on the mainland and in Antarctica, but did not meet accuracy specifications for 1:250,000 mapping.

PB-242 813/4GA PC$5.25/MF$2.25
Association of American Geographers, Washington, D.C.
Using Remote Sensor Data for Land Use Mapping and Inventory: A User Guide.
Interagency rept. (Final),
Joseph W. Wiedel, and Richard Kleckner. Jul 74, 124p* IR-USGS-253, USGS-LI-75/002
Contract DI-14-08-0001-13702

Descriptors: *Land use, *Photogrammetry, *Remote sensing, Inventories, Land surveys, Ecology, Photographic reconnaissance, Photographic images, Census tabulations, Scientific satellites, Drainage, Covering, Urban areas, Geological maps, Hydrology, Land titles, Soil surveys, Topography, Photointerpretation, Roads.
Identifiers: ERTS-1 satellite, Geologic applications program.

Contents:
- Geographic applications program and test sites;
- Acquisition of high altitude photography and ERTS-1 imagery for land use mapping;
- Supplemental source materials for land use mapping;
- Coordinate systems for land use mapping and information systems;
- Plotting bases for land use data;
- Land use classifications using remote sensor data;
- Land use interpretation from remote sensor data and land use map compilation;
- Field verification of land use mapping;
- Selected overlays for land use maps;
- Geographic information systems for land use data;
- Area measurement for obtaining land use data;
- Land use change detection.

8C. Dynamic Oceanography

AD-A013 665/5GA PC$3.25/MF$2.25
Scripps Institution of Oceanography La Jolla Calif Advanced Ocean Engineering Lab
Marine Physics: Internal Waves and Microstructure.
Technical progress rept. 1 Jan-30 Jun 75,
James L. Cairns, Gordon O. Williams, Charles S. Cox, and R. E. Lange. 30 Jun 75, 12p Rept nos. AOEL-73, SIO-Rec-75-22
Contract N00014-75-C-1034
See also AD-785 262.

Descriptors: *Internal waves, Ocean environments, Microstructure, Sea water, Thermal properties, Marine geophysics, Temperature, Oceanographic data, Oceanographic equipment, Temperature measuring instruments.

This semi-annual report reflects the technical status of internal wave and microstructure studies conducted within this laboratory.

AD-A014 032/7GA PC$3.75/MF$2.25
Louisiana State Univ Baton Rouge Coastal Studies Inst
Physical Processes in a Fringing Reef System.
Technical rept.,
Harry H. Roberts, Stephen P. Murray, and Joseph N. Suhayda. 10 Jan 75, 31p Rept no. TR-196
Contract N00014-69-A-0211-0003
Availability: Pub. in Jnl. of Marine Research, v33 n2 p233-260 1975.

Descriptors: *Coral reefs, *Ocean waves, *Ocean currents, Caribbean Sea, Deep water, West Indies, Barbados, Offshore, Shallow water, Sediments, Ocean tides, Tidal currents, Ocean bottom topography, Surface roughness, Modification, Attenuation, Friction, Reprints.
Identifiers: Grand Cayman Island, *Fringing reefs, Lagoons.

Field studies primarily on Grand Cayman Island and supporting investigations on Barbados furnished data concerning the magnitudes and spatial gradients of physical processes which interact with typical Caribbean reef systems and their unusual sea floor configurations. In situ measurements from the fore-reef shelf indicate that currents and deepwater waves are significantly modified by reef morphology. Wave heights are reduced 20% over a distance of approximately 0.4 km, whereas a 75% reduction results from breaking processes as waves cross the reef crest and enter the back-reef lagoon. These highly modified waves induce a lagoonal circulation pattern which is reflected in the sediment distribution. Currents on the fore-reef shelf exhibit a distinct periodicity near the diurnal tidal frequency. Rather unidirectional and high-velocity flow (occasionally greater than 50 cm/sec) is characteristic of the deep (21 m) shelf margin, but considerably weaker (average 5-7 cm/sec)

and more directionally variable currents are found on the shallow shelf. Current speeds are attenuated by roughly 30% over the narrow shelf. Statistical filtering illustrates that tidal currents are dominant on the shelf, having amplitudes up to 20 cm/sec, and that the long-term mean westerly drift averages between 5 and 10 cm/sec, reaching values of 30 cm/sec under extreme conditions. Attenuation of wave heights and current speeds across the shelf is attributed primarily to frictional effects resulting from interactions with the unique boundary conditions presented by extreme bottom roughness.

N75-26615/5GA PC$9.25/MF$2.25
Technische Hogeschool, Delft (Netherlands).
Offshore Sediment Transport and Equilibrium Beach Profiles.
Ph.D. Thesis.
D. H. Swart. 18 Dec 74, 318p

Descriptors: *Beaches, *Coasts, *Ocean models, *Sediment transport, Environmental engineering, Nearshore water, Ocean bottom, Ocean currents, Prediction analysis techniques, Structural engineering, Water waves.

For abstract, STAR 1317

8D. Geochemistry

COM-75-11120/3GA PC$3.25
Delaware Univ., Newark. Coll. of Marine Studies.
Biogeochemistry of Humic Compounds,
F. M. Swain. 1972, 27p DEL-SG-15-75 NOAA-75072205
Grant NOAA-2-35223
Prepared in cooperation with Minnesota Univ., Minneapolis. Dept. of Geology and Geophysics. Pub. in Proceedings of International Meeting, Humic Substances, Nieuwersluis, 1972 p337-360 1972.

Descriptors: *Geochemistry, *Carbohydrates, *Geological sedimentation, Organic compounds, Sediments.
Identifiers: *Humus, Biogeochemistry, Sea Grant program.

The largest amounts of humic substances occur in marine shales. The disseminated nature of this type of humus results in its being well preserved and less modified from its original state than such of terrestrial humus. Carbohydrate residues are important components of humus of all ages, but these compounds seem to have appeared in abundance in Devonian time 350-325 million years ago. Of many aquatic environments favorable for preservation of humic residues deep gulf and deep sea environments are among the best owing to high pressures and lack of bacterial activity.

E75-10349 PC$5.25/MF$2.25
Wyoming Univ., Laramie. Dept. of Geology.
Selenium in Soils of the Lower Wasatch Formation, Campbell County, Wyoming: Geochemistry, Distribution, and Environmental Hazards,
Kenneth E. Kolm. 6 Jun 75, 114p NASA-CR-143151
Contract NAS5-21799
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Selenium, Soils, Wyoming, Geochemistry, Environment effects, Vegetation, Bedrock, Climatology, Plants(Botany), Sandstones, Earth resources program, pH, Statistical analysis, Maps.

The author has identified the following significant results. Seleniferous Shingle series soils and sandstone outcrops of section 27, T 48 N, R 71 W, Wyoming are mapped on aerial photography by their association with Astragalus bisulcatus. Chemical leachate analyses and atomic absorption methods reveal all studied Samsil and Shingle soils to contain acid, base, and water soluble selenium compounds, and that water extractions showed varied concentration behavior due to soil pH. Acid-soluble selenium is found to be associated with smectite. Statistical analysis confirm that A. bisulcatus presence has a weak influence on soil-lens organic selenium concentration, and determine the importance of other geobotanical factors for convertor presence. Environmental procedures of high selenium lens burial, convertor plant eradication, and revegetated site monitoring are recommended. Usage of density analysis and photographic enlargement are used to successfully produce both a control area and a Campbell County, Wyoming regional map of A. bisulcatus supportive soils and outcrops using Skylab photography.

PB-243 454/6GA
Mag Tape $97.50;Foreign $122.50
Geological Survey, Reston, Va. Eastern Mineral Resources Branch.
Geochemical Data in the Eastern Part of the Upper Peninsula of Michigan, 1972-73.
Data file,
Walter Ketterer. 1973, 1 reel mag tape USGS/GD-75/007 DOI/DF-75/001
Specify tape recording mode desired: 9 track, 800 or 1600 bpi, odd parity, EBCDIC; or 7 track, 556 or 800 bpi, odd or even parity, BCD.

Descriptors: *Data file, *Geochemical prospecting, *Metalliferous mineral deposits, *Michigan, *Ontario, Sands, Magnetic tapes, Glacial deposits, Soil chemistry.

A study in the Michigan part of the Army Map Service Sault Ste. Marie, Michigan, U.S., Ontario, Canada, 2 degrees quadrangle evaluated geochemical analyses of soil samples from a glaciated region as an aid to finding target areas that have potential for ores of metals. Most of the samples are soil from the upper 30 cm (12 in) of unconsolidated debris overlying bedrock, but some samples of bedrock, stream sediments, beach sands, peat, and mulch were analyzed. Bedrock overburden ranges from none in areas of bedrock outcrops to as much as 133 m (436 ft) and is composed of clayey silt to fine sand of lacustrine origin clavey till to boulder till of glacier origin, sand to boulders of fluioglacial origin and recently formed peat and muck. Analytical results indicate that soil samples from overburden of unknown thickness and composition in a glaciated region likely will not indicate target areas if overburden is more than 1 1/2 - 2 m (5 - 7 ft) thick. This is especially true if overburden is clayey silt or clayey till.

8E. Geodesy

AD-A013 992/3GA PC$4.75/MF$2.25
Naval Surface Weapons Center Dahlgren Lab Va
Error Model for Geodetic Positions Derived from Doppler Satellite Observations,
R. J. Anderle. Aug 75, 84p Rept no. NSWC/DL-TR-3368

Descriptors: *Geodesy, Geodetic satellites, Doppler systems, Errors, Orbits.
Identifiers: *Spacecraft trajectories.

Doppler observations of Navy Navigation satellites have been used to strengthen and extend many terrestrial geodetic networks. The main sources of errors in positions determined from these observations are random error of observations, random and systematic errors in satellite positions due to undercertainties in the gravity field, and biases in the coordinate system in which the satellite ephemeris is given. Effects of uncertainties in the gravity field on station coordinates computed with respect to a precise satellite ephemeris are reduced to about 70 cm after 20 satellite passes are observed, but systematic effects prevent assurance that additional observations will improve the accuracy further. A one part per million reduction in scale must be applied to positions computed with the ephemeris to obtain agreement with terrestrial and other precise determinations of scale. The origin of the system is coincident with the center of mass of the earth to 1 m accuracy but the polar axis may be tilted three to five meters at the earth's surface with respect to coordinate systems upon which star catalogues are based.

E75-10344 PC$3.75/MF$2.25
Battelle Columbus Labs., Ohio.
Calibration and Evaluation of Skylab Altimetry for Geodetic Determination of the Geoid.
Progress rept. no. 24, 30 Jun 75,
A. George Mourad, S. Gopalapillai, M. Kuhner, and D. M. Fubara. 14 Jul 75, 27p NASA-CR-143146
Contract NAS9-13276

Descriptors: Altimeters, Geoids, Ocean surface, Ground truth, Tides, Puerto Rico, Ocean bottom, EREP, Skylab program, Geodesy, Oceanography, Least squares method.

The author has identified the following significant results. The Skylab altimeter experiment has proven the capability of the altimeter for measurement of sea surface topography. The geometric determination of the geoid/mean sea level from satellite altimetry is a new approach having significant applications in many disciplines including geodesy and oceanography. A generalized least squares collocation technique was developed for determination of the geoid from altimetry data. The technique solves for the altimetry geoid and determines the one bias term for the combined effect of sea state, orbit, tides, geoid, and instrument error using sparse ground truth data. The influence of errors in orbit and a priori geoid values are discussed. Although the Skylab altimeter instrument accuracy is about + or - 1m, significant results were obtained in identification of large geoidal features such as over the Puerto Rico trench. Comparison of the results of several passes shows that good agreement exists between the general slopes of the altimeter geoid and the ground truth, and that the altimeter appears to be capable of providing more details than are now available with best known geoids.

8F. Geography

E75-10346 PC$3.25/MF$2.25
New Mexico Bureau of Mines and Mineral Resources, Socorro.
Earth Resources Evaluation for New Mexico by LANDSAT-2.
Progress rept. 27 Feb-31 May 75,
Karl Vonderlinden, Sandra Feldman, Michael H. Inglis, David Tabet, and Frank E. Kottlowski. 31 May 75, 5p NASA-CR-143148
Contract NAS5-20916

Descriptors: New Mexico, Lakes, Mines(Excavations), Water pollution, Ground truth, Rivers, Earth resources program, Cost effectiveness, Waste disposal, Salinity, Industries.

The author has identified the following significant results. A cost effective technique is considered for measuring and monitoring surface area fluctuations in lake size in southeastern New Mexico over a two year period. The lakes are shallow, and therefore a small volume increase results in a noticeable increase in sur-

face area on the LANDSAT imagery. Lakes sizes are measured on an 1(2)S Digicol viewer. Water from potash mining operations is being pumped into some of these lakes and the input volume is documented. Using water input and surface contour as well as direct lake level measurements as ground truth as well as the LANDSAT images, calculations may be possible regarding how much additional industrial water can be added to these lakes without the occurrence of saline seepage into the major river system.

E75-10352 PC$3.75/MF$2.25
Bureau of Mineral Resources, Geology and Geophysics, Canberra (Australia). Dept. of Minerals and Energy.
Multidisciplinary Study of Earth Resources Imagery of Australia, Antarctica and Papua, New Guinea.
Final rept. 1972-Jan 74,
N. H. Fisher. Mar 75, 31p NASA-CR-143154

Descriptors: Forests, Australia, New Guinea, Antarctic regions, Agriculture, Geology, Hydrology, Land use, Soils, Erosion, Blight, Coasts, Ocean currents, Floods, Ground water, Snow, Sands, Earth resources program, Pattern recognition, Mapping, Photointerpretation.

The author has identified the following significant results. A thirteen category recognition map was prepared, showing forest, water, grassland, and exposed rock types. Preliminary assessment of classification accuracies showed that water, forest, meadow, and Niobrara shale were the most accurately mapped classes. Unsatisfactory results, were obtained in an attempt to discriminate sparse forest cover over different substrates. As base elevation varied from 7000 to 13,000 ft, with an atmospheric visibility of 48 km, no changes in water and forest recognition were observed. Granodiorite recognition accuracy decreased monotonically as base elevation increased, even though the training set location was at 10,000 ft elevation. For snow varying in base elevation from 9400 to 8420 ft, recognition decreases from 99% at the 9400 ft training set elevation to 88% at 8420 ft. Calculations of expected radiance at the ERTS sensor from snow reflectance measured at the site and from Turner model calculations of irradiance, transmission and path radiance, reveal that snow signals should not be clipped, assuming that calculations and ERTS calibration.

E75-10354 PC$10.00/MF$2.25
Texas A and M Univ., College Station. Remote Sensing Center.
Monitoring the Vernal Advancement and Retrogradation (Green Wave Effect) of Natural Vegetation.
Final rept. Sep 73-Nov 74,
J. W. Rouse, Jr., R. H. Haas, D. W. Deering, J. A. Schell, and J. C. Hanlan. Nov 74, 369p RSC-1978-4 NASA-CR-143156
Contract NAS5-21857
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Rangelands, Great Plains Corridor(North America), Agriculture, Vegetation, Land use, Seasons, Soils, Grasslands, Wood, Multispectral band scanners, Earth resources program, Digital data, Greenhouse effect.

The author has identified the following significant results. The Great Plains Corridor rangeland project successfully used natural vegetation systems as phenological indicators of season development and climatic effects upon regional growth conditions. An effective method was developed for quantitative measurement of vegetation conditions, including green biomass estimates, recorded in bands 5 and 6, corrected for sun angle, were used to compute a ratio parameter (TV16) which is shown to be highly correlated with green biomass and vegetation moisture content. Analyses results of ERTS-1 digital data and correlated ground data are summarized. Attention was given to analyzing weather influences and test site variables on vegetation condition measurements with ERTS-1 data.

E75-10359 PC$6.25/MF$2.25
Long Island Univ., Greenvale, N.Y. Science Engineering Research Group.
In situ Spectroradiometric Quantification of ERTS Data.
Final rept. Jul 72-Jan 75,
Edward F. Yost. Feb 75, 166p TR-21 NASA-CR-143161
Contract NAS5-21793
Original contains color illustrations. Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Atmospheric, Deserts, Surface water, Floods, Ground truth, Vegetation, Forests, Arizona, Geology, Radiometers, Photometers, Spectral reflectance, Digital systems, Earth resources program.

The author has identified the following significant results. Analysis of ERTS-1 photographic data were made to quantitatively relate ground reflectance measurements to photometric characteristics of the images. Digital image processing of photographic data resulted in a nomograph to correct for atmospheric effects over arid terrain. Optimum processing techniques to derive maximum geologic information from desert areas were established. Additive color techniques to provide quantitative measurements of surface water between different orbits were developed which were accepted as the standard flood mapping techniques using ERTS.

N75-26475/4GA PC$4.75/MF$2.25
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
Methods of Extending Signatures and Training Without Ground Information.
Final and Technical Report, 15 May 1974 - 14 Mar. 1975.
R. G. Henderson, G. S. Thomas, and R. F. Nalepka. May 75, 91p NASA-CR-141864, ERIM-109600-16-F
Contract NAS9-14123

Descriptors: *Data processing, *Pattern recognition, *Remote sensors, *Signature analysis, Landsat satellites, Multispectral band scanners.

For abstract, STAR 1317

N75-26481/2GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Aviation'S Role in Earth Resources Surveys.
C. A. Syvertson, and D. R. Mulholland. Aug 72, 33p NASA-TM-X-62436, A-6081

Descriptors: *Aerial photography, *Earth resources survey aircraft, *Remote sensors, Data acquisition, Earth resources program.

For abstract, STAR 1317

PB-243 933/9GA PC$12.50/MF$2.25
Geological Survey, Sioux Falls, S. Dak. EROS Data Center.
ERTS Image Interpretation Workshop. Syllabus.
Open file rept.
28 Jun 74, 550p* USGS/OFR-75/196

Descriptors: *Natural resources, *Remote sensing, *Spaceborne photography, *Photointerpretation, *Meetings, Photographic images, Land use, Data processing, Mineral deposits, Hydrology, Agriculture.
Identifiers: ERTS-1 satellite, Remote detectors, Image processing.

The two major objectives of the training course are: (1) to train engineers, scientists, and managers involved in resources investigations of the use of remotely sensed data, especially that provided by ERTS-I and similar satellites; and (2) to demonstrate the value of remote sensing to interdisciplinary/multidisciplinary cooperation in environmental analyses, resource inventories, and land-use planning.

8G. Geology and Mineralogy

AD-A013 748/9GA PC$3.25/MF$2.25
Northwestern Univ Evanston Ill
Soft X-Ray Emission and Adsorption in Diamond,
A. R. Lubinsky, D. E. Ellis, and G. S. Painter. 15 Oct 74, 9p AFOSR-TR-75-1212
Grant AF-AFOSR-2012-71
Availability: Pub. in Physical Review B, v11 n8 p3131-3138, 15 Apr 75.

Descriptors: *Diamonds, Soft x rays, X ray absorption analysis, X ray spectra, Emission spectra, Transition metals, Nuclear binding energy, Atomic spectroscopy, X ray spectroscopy, Reprints.

The x-ray K-emission spectrum and the soft-x-ray absorption spectrum are calculated for diamond and compared with experiment. The influence of transition matrix elements, calculated in a one-electron approximation, is discussed. Binding-energy corrections on the core and valence states are estimated and used to explain observed shifts between band transition energies and experimental data. Approximate methods are used to study localized valence relaxation effects on the transition matrix elements in emission. (Author)

AD-A013 997/2GA PC$7.00/MF$2.25
Woods Hole Oceanographic Institution Mass
Descriptions of WHOI Sediment Cores. Volume 1.
Technical rept.,
D. A. Johnson, and A. H. Driscoll. May 75, 183p
Rept no. WHOI-75-8-Vol-1
Contract N00014-74-C-0262, Grant NSF-DES73-06463
See also Volume 2, AD-A013 998.

Descriptors: *Ocean bottom sampling, *Cores, *Sediments, Tables(Data), Navigation charts, Gravity, Marine geology, Oceanographic ships, Visual inspection, Pyrite, Clay minerals, Foraminifera, Sponges, Radiolaria, Atlantic Ocean, Indian Ocean, Pacific Ocean.
Identifiers: Atlantis vessel, Chain vessel, Knorr vessel, Marsden squares, Diatons, Pteropods, Biostratigraphy.

The report presents visual core descriptions and smear slide analyses for all cores in the Woods Hole Oceanographic Institution geological samples collection which were obtained prior to November 1973. Approximately 1000 coring stations from the Atlantic, Indian and Pacific oceans and adjacent seas are represented. Charts of ships' track and computer listings of all cores are also included.

AD-A013 998/0GA PC$11.50/MF$2.25
Woods Hole Oceanographic Institution Mass

Descriptions of WHOI Sediment Cores, Volume 2.
Technical rept.,
D. A. Johnson, and A. H. Driscoll. May 75, 475p
Rept no. WHOI-75-8-Vol-2
Contract N00014-74-C-0262, Grant NSF-DES73-06463
See also Volume 1, AD-A013 997, and Volume 3, AD-A013 999.

Descriptors: *Ocean bottom sampling, *Cores, *Sediments, Tables(Data), Navigation charts, North Atlantic Ocean, Plankton, Marine geology, Sponges, Visual inspection, Oceanographic ships, Clay minerals, Foraminifera, Lithology, Indian Ocean, South Atlantic Ocean, Mediterranean Sea.
Identifiers: Atlantis 2 vessel.

The report presents visual core descriptions and smear slide analyses for all cores in the Woods Hole Oceanographic Institution geological samples collection which were obtained prior to November 1973. Charts of ships' track and computer listings of all cores are included.

AD-A013 999/8GA PC$11.50/MF$2.25
Woods Hole Oceanographic Institution Mass
Descriptions of WHOI Sediment Cores, Volume 3.
Technical rept.,
D. A. Johnson, and A. H. Driscoll. May 75, 456p
Rept no. WHOI-75-8-Vol-3
Contract N00014-74-C-0262, Grant NSF-DES73-06463
See also Volume 2, AD-A013 998, and Volume 4, AD-A014 000.

Descriptors: *Ocean bottom sampling, *Cores, *Sediments, Tables(Data), Navigation charts, Marine geology, Visual inspection, Oceanographic ships, Pyrite, Foraminifera, Lithology, Clay minerals, Sponges, North Atlantic Ocean, Mediterranean Sea.
Identifiers: Chain Vessel.

The report presents visual core descriptions and smear slide analyses for all cores in the Woods Hole Oceanographic Institution geological samples collection which were obtained prior to November 1973. Charts of ships' track and computer listings of all cores are included.

AD-A014 000/4GA PC$11.50/MF$2.25
Woods Hole Oceanographic Institution Mass
Descriptions of WHOI Sediment Cores, Volume 4.
Technical rept.,
D. A. Johnson, and A. H. Driscoll. May 75, 457p
Rept no. WHOI-75-8-Vol-4
Contract N00014-74-C-0262, Grant NSF-DES73-06463
See also Volume 3, AD-A013 999.

Descriptors: *Ocean bottom sampling, *Cores, *Sediments, Tables(Data), Navigation charts, Marine geology, Visual inspection, Oceanographic ships, Pyrite, Foraminifera, Lithology, Clay minerals, Sponges, Atlantic Ocean, Indian Ocean, Pacific Ocean.
Identifiers: Chain vessel, Diatoms, Pteropods, Biostratigraphy.

The report presents visual core descriptions and smear slide analyses for all cores in the Woods Hole Oceanographic Institution geological samples collection which were obtained prior to November 1973. Charts of ships' track and computer listings of all cores are included.

AD-A014 006/1GA PC$3.75/MF$2.25
Louisiana State Univ Baton Rouge Coastal Studies Inst
Deltaic Processes.
Technical rept.,
James M. Coleman. Sep 75, 28p Rept no. TR-197
Contract N00014-69-A-0211-0003
Pub. in Finding and Exploring Ancient Deltas in the Subsurface, pA1-A25, AAPG Marine Geology Committee Workshop, 6 Apr 75, Dallas, Tex.

Descriptors: *Sediments, *Deltas, *Geomorphology, Subsurface, Climate, Alluvium, Deposits, Sand, Rivers, Ocean waves, Tides, Volume, Wind, Continental slopes, Tectonics, Coastal regions, Correlation techniques.
Identifiers: Facies, Littoral zone.

Depositional facies in deltaic sediments result from interacting dynamic processes (climate, wave energy, tidal action, etc.), which vary in both intensity and frequency. The results of a comparison of 55 major world deltas indicated that no one delta model could be formulated to use as a basis for predicting vertical sequences in all of the deltas. The study showed that sand body distribution, geometry and internal characteristics are primarily a function of wave energy distribution, river-mouth dynamics, nearshore currents, tidal energy, and tectonics and geometry of the receiving basin.

AD-A014 030/1GA PC$3.25/MF$2.25
Hawaii Inst of Geophysics Honolulu
Geological and Geophysical Studies of the Canton Trough Region.
Bruce R. Rosendahl, Ralph Moberly, A. John Halunen, John C. Rose, and Loren W. Kroenke.
29 Nov 74, 12p Rept no. HIG-Contrib-565
Contract N00014-70-A-0016-0001, Grant NSF-GA-30740
Availability: Pub. in Jnl. of Geophysical Research, v80 n17 p2565-2574, 10 Jun 75.

Descriptors: *Submarine troughs, Ocean bottom topography, Pacific Ocean, Equatorial regions, Structural geology, Ocean ridges, Linearity, Marine geology, Pacific Ocean Islands, Faults(Geology), Sediments, Igneous rock, Ocean bottom, Gravity anomalies, Magnetic anomalies, Reprints.
Identifiers: Canton submarine trough.

The Canton Trough is an extremely deep linear feature flanked by large en echelon ridges. This system, located in the equatorial Central Pacific Basin, can be traced ENE from the Phoenix Islands for a distance of more than 500 km. The surrounding topography is lineated parallel to the ridge-trough-ridge system and probably originated by block faulting. A similar mode of formation is inferred for the main trough itself, the implication being that the vertical displacement may exceed 3000 m in some localities. This interpretation is reinforced by the occurrence near the base of the trough of an unusually diverse assemblage of igneous rocks, including normal oceanic tholeiitic basalts, coarse-grained diabases, anorthositic gabbros, pegmatic gabbros, and cumulate gabbros. Simple vertical displacements of crustal blocks also could produce the major components of the observed gravity anomaly signatures as well as explain the necessity in the gravity models for a crustal root beneath the Canton Trough. Sediments within the Canton Trough region are predominately radiolarian oozes and calcareous turbidites, which correlate with transparent layers and highly stratified units observed on reflection profiler records. Residual magnetic anomalies are at least partly produced by the great topographic relief of the ridge-trough-ridge zone. Although there is some evidence that the Canton Trough and its surrounding structures represent an extension of the Clipperton Fracture Zone into the Central Pacific Basin, the absence of structural continuity, the lack of regional depth changes, and limitations imposed by the regional tectonic patterns argue against this hypothesis.

AD-A014 033/5GA PC$3.25/MF$2.25
Lamont-Doherty Geological Observatory Palisades N Y
Amazon Cone: Morphology, Sediments, Age, and Growth Pattern.
Journal article,
John E. Damuth, and Naresh Kumar. 18 Mar 74, 18p Rept no. LDGO-2193
Contract N00014-67-A-0108-0004, Grant NSF-GX-34410
Availability: Pub. in Geological Society of America Bulletin, v86 p863-878 Jun 75.

Descriptors: *Continental slopes, *Sediments, Deltas, Fans, Equatorial regions, Atlantic Ocean, Deep oceans, Ocean bottom topography, Conical bodies, Abyssal zones, South America, Rivers, Sedimentation, Spatial distribution, Rates, Geologic age determination, Marine geology, Geomorphology, Reprints.
Identifiers: Amazon River cone, Deep sea fans, Equatorial Atlantic Ocean, Continental margins.

The morphology, sediment distribution, and growth pattern of the Amazon cone are similar to those of other deep-sea fans; its sediment, at least during the late Quaternary Period, was deposited in response to glacial-interglacial cycles, and its age of formation is estimated to be middle to late Miocene. Sedimentation on the Amazon cone, at least during Quaternary time, has been climatically controlled. During high sea-level stands, terrigenous sediment is trapped on the inner continental shelf, and only pelagic sediment is deposited on the cone. During low sealevel stands, the Amazon River discharges terrigenous sediment into the Amazon Submarine Canyon, from where it is easily transported to the cone by gravity-controlled sediment flows. Wisconsin sedimentation rates on the cone were in excess of 30 cm/1000 yr. Average sedimentation rates for the Pleistocene Epoch, based on the extrapolated age (2.2 m.y.) of a prominent acoustic reflector within the cone, range from 50 to 115 cm/1000 yr. The Amazon cone began to form about 8 to 15 m.y. B.P. and is thus about one-tenth the age of the Equatorial Atlantic. (Author)

N75-26482/0GA PC$3.25/MF$2.25
Colorado School of Mines, Golden. Dept. of Geology.
Application of Remote Sensor Data to Geologic Analysis of the Bonanza Test Site Colorado.
Semiannual Progress Report, 1 Oct. 1974 - 31 Mar. 1975.
K. Lee. Apr 75, 20p NASA-CR-143082, RSR-75-2
Contract NGL-06-001-015

Descriptors: *Colorado, *Geology, *Remote sensors, Earth resources, Hydrogeology, Mineral deposits, Rocky mountains (North america), Uranium, Water resources.

For abstract, STAR 1317

ORNL-TM-4899 PC$6.75/MF$2.25
Oak Ridge National Lab., Tenn.
Development of Nondestructive Evaluation Techniques for Large Rock Specimens.
B. E. Foster, S. D. Snyder, and R. W. McClung.
Jun 75, 72p
Contract W-7405-eng-26

Descriptors: (*Rocks, *Gamma radiography), (*Mines, *Safety), Stresses, X-ray radiography.

No abstract available.

PAT-APPL-574 992/GA PC$3.75/MF$2.25
Department of the Interior, Washington, D.C.
Method and Apparatus for Determining Rock Stress in Situ.
Patent Application,
Rodolfo De La Cruz. Filed 6 May 75, 32p
DOCKET/SUR-2065

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Rock mechanics, *Rock tests, *Patent applications, Stresses, Field tests, Rock properties, Boreholes.

The patent application relates to measurement of stress in rock, and more particularly to a jack fracturing method and apparatus for measuring the natural state of stress of rock, as well as the value of Young's Modulus for an assumed value of Poisson's Ratio of the rock.

PB-243 982/6GA PC$5.25
Northern Great Plains Resource Program, Denver, Colo.
Regional Topography, Physiography, and Geology of the Northern Great Plains.
Open file rept.,
William R. Keefer. 1974, 122p NGPRP/CD-74/500 USGS/OFR-74/50

Descriptors: *Topographic maps, *North Dakota, *Montana, *Wyoming, *South Dakota, Topographic features, Geology, Geomorphology, Mineral deposits, Land reclamation, Erosion control, Coal mining.
Identifiers: Northern Great Plains, Powder River basin, Williston basin, *Mineral resource planning.

The report analyzes the topography, physiography and geology of a 63 county area in North Dakota, Montana, Wyoming, and South Dakota. Geologic maps are included. In addition 7 1/2 minute quadrangle slope maps are included for 5 selected sites that are representative of the areas that are likely to be impacted with accelerated coal development in the Northern Great Plains. These maps are provided as tools for planning transportation facilities, utility corridors, siting of mines and related facilities, controlling erosion, determining reclamation potential, and preparation of mining plans.

8H. Hydrology and Limnology

ANL/WR-75-1 PC$10.60/MF$2.25
Argonne National Lab., Ill.
Water Resources Research Program. Volume I. Measurements of Physical Phenomena Related to Power Plant Waste Heat Discharges: Lake Michigan, 1973--1974.
J. V. Tokar, S. M. Zivi, A. A. Frigo, L. S. Van Loon, and D. E. Frye. Mar 75, 352p
Contract W-31-109-Eng-38

Descriptors: (*Point beach-1 reactor, *Thermal effluents), (*Point beach-2 reactor, Thermal effluents), (*Zion-1 reactor, Thermal effluents), (*Zion-2 reactor, Thermal effluents), Aerial monitoring, Diffusion, Dyes, Hydrodynamics, Lake michigan, Measuring methods, Plumes, Sampling, Thermal pollution, Tracer techniques, Waste disposal, Water pollution.

For abstract, see NSA 32 03, number 06462.

COM-75-11048/6GA PC$4.75/MF$2.25
National Oceanic and Atmospheric Administration, Rockville, Md.
International Field Year for the Great Lakes. IFYGL Bulletin No. 14.
Jun 75, 91p IFYGL-Bull-14 NOAA-75070101
See also Bulletin no. 13 dated Feb 75, COM-75-10675.

Descriptors: *Great Lakes, *Research projects, Meteorological data, Lake waves, Technical reports, Documents, Meetings, Bibliographies, Air water interactions, Abstracts, Remote sensing, Canada, United States.
Identifiers: International Field Year for the Great Lakes.

The bulletin contains information on activities of the International Field Year Great Lakes for June 1975. Included are a cumulative IFYGL bibliography, project reports, panel reports, abstracts of IFYGL papers, data summaries, and information on data management for both Canada and the United States.

CONF-750503-15 PC$4.50/MF$2.25
Oak Ridge National Lab., Tenn.
Cycling of exp 137 CS in Soil and Vegetation of a Flood Plain 30 Years after Initial Contamination.
R. C. Dahlman, and P. Van Voris. 1975, 30p

Descriptors: (*Cesium 137, *Radioecological concentration), (*Soils, *Radionuclide migration), (*Plants, *Radionuclide kinetics), Biological effects, Contamination, Floods, Radioactive wastes, Roots.

For abstract, see NSA 32 03, number 06429.

CONF-750503-16 PC$4.75/MF$2.25
Oak Ridge National Lab., Tenn.
Review of the Ecological Parameters of Radionuclide Turnover in Vertebrate Food Chains.
T. Kitchings, D. DiGregorio, and P. Van Voris. 1975, 32p

Descriptors: (*Food chains, *Radionuclide kinetics), (*Radioisotopes, *Radioecological concentration), (*Reactors, *Radioactive wastes), (*Radioecology, *Reviews), Biological models, Ecosystems, Environmental effects.

For abstract, see NSA 32 03, number 06440.

CONF-750503-17 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Spatial Distribution of Radionuclides in Lake Michigan Biota Near the Big Rock Point Nuclear Plant.
M. A. Wahlgren, E. M. Yaguchi, D. M. Nelson, and J. S. Marshall. 1974, 15p
Contract W-31-109-Eng-38

Descriptors: (*Big rock point reactor, *Radiation monitoring), (*Plutonium 239, Radiation monitoring), (*Plutonium 240, Radiation monitoring), Algae, Cesium 134, Cesium 137, Cobalt 60, Crustaceans, Environmental effects, Lake michigan, Plants, Radioactive wastes, Radioecological concentration, Radionuclide kinetics, Spatial distribution, Strontium 90, Zinc 65.

For abstract, see NSA 32 03, number 06441.

CONF-750503-7 PC$4.75/MF$2.25
National Oceanic and Atmospheric Administration, Ann Arbor, Mich. Great Lakes Environmental Research Lab.
Specific Activity and Concentration Model Applied to Cesium-137 Movement in a Eutrophic Lake.
H. A. Vanderploeg, R. S. Booth, and F. H. Clark. 1975, 31p

Descriptors: (*Aquatic ecosystems, *Radionuclide kinetics), (*Lakes, Radionuclide migration), (*Cesium 137, *Radioecological concentration), (*Radionuclide migration, *Functional models), Animals, Plants, Sediments, Simulation, Time dependence.

For abstract, see NSA 32 03, number 06436.

CONF-750530-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Application of a Soil and Ground-Water Pollutant-Transport Model.
M. Reeves, and J. O. Duguid. 1975, 15p

Descriptors: (*Radioactive waste disposal, *Underground disposal), (*Radionuclide migration, *Mathematical models), (*Ground water, Radionuclide migration), (*Soils, Radionuclide migration), Computer calculations, Saturation, Two-dimensional calculations, Water pollution.

For abstract, see NSA 32 03, number 06430.

CONF-750607-9 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Preliminary Cross-Section Sensitivity Analysis for an Air-over-Ground Environment.
J. V. I Pace, II, and D. E. Bartine. 1974, 4p

Descriptors: (*Nuclear explosions, *Radiation dose distributions), Atmospheric explosions, Computer calculations, Computer codes, Environment, Gamma sources, Neutron spectra, Nuclear weapons, Radioactivity, S codes, Surface air, V codes.

For abstract, see NSA 32 03, number 06426.

COO-2308-003 PC$5.75/MF$2.25
Manomet Bird Observatory, Mass.
Avian Radioecology on a Nuclear Power Station Site. Technical Progress Report, 1 July 1974--30 June 1975.
C. K. Levy. 1975, 55p
Contract AT(11-1)-2308

Descriptors: (*Birds, *Radioecology), (*Potassium 40, *Radiation monitoring), (*Zirconium 95, Radiation monitoring), Body burden, Cesium 137, Gamma detection, Iodine 131, Meteorology, Niobium 95, Nuclear power plants, Plants, Reactor sites.

For abstract, see NSA 32 03, number 06410.

DPSPU-75-30-1 PC$5.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Plant.
Environmental Monitoring in the Vicinity of the Savannah River Plant. Annual Report, 1974.
1974, 38p

Descriptors: (*Savannah river plant, *Environment), (*Strontium 89, *Radiation monitoring), (*Strontium 90, Radiation monitoring), (*Tritium, Radiation monitoring), Food, Milk, Monitoring, Pesticides, Plants, Plutonium, Radioactivity, Radionuclide migration, Sampling, Sediments, Soils, Surface air, Surface waters.

For abstract, see NSA 32 03, number 06411.

ERDA-35 PC$4.00/MF$2.25
Energy Research and Development Administration, Washington, D.C.
Feasibility of Standardization in Global Monitoring of Pollutant Distributions. Report of the Working Group, July 3--5, 1974, Edinburgh, Scotland.
1974, 26p

Descriptors: (*Environment, *Pollution), (*Chemical effluents, *Monitoring), (*Radioactive effluents, *Radiation monitoring), (*Air pollution, Monitoring), Land pollution, Measuring methods, Sampling, Standards, Water pollution.

For abstract, see NSA 32 03, number 06412.

E75-10350 PC$3.25/MF$2.25
Geological Survey, Reston, Va.
Drainage Basin Characteristics from ERTS Data.
Progress rept. 1 Jul-31 Dec 74,
Este F. Hollyday. 1 Jan 75, 10p NASA-CR-143152
Contract NASA-Order-S-70243-AG

Descriptors: Drainage patterns, Structural basins, Forests, Vegetation, Agriculture, Urban development, Water, Land use, Earth resources program, Water flow, Regression analysis.

The author has identified the following significant results. ERTS-derived measurements of forests, riparian vegetation, open water, and combined agricultural and urban land use were added to an available matrix of map-derived basin characteristics. The matrix of basin characteristics was correlated with 40 stream flow characteristics by multiple regression techniques. Fifteen out of the 40 equations were improved. If the technique can be transferrd to other physiographic regions in the nation, the opportunity exists for a potential annual savings in operations of about $250,000.

E75-10351 PC$4.75/MF$2.25
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
An ERTS-1 Investigation for Lake Ontario and Its Basin.
Final rept. 31 Jul 72-31 Jul 74,
Fabian C. Polcyn, Allen Falconer, Thomas W. Wagner, and Diana L. Rebel. Jul 75, 96p ERIM-19330-65-F NASA-CR-143153
Contract NAS5-21783
Original contains color illustrations. Original contains color imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Lake Ontario, Structural basins, Drainage patterns, Watersheds, Hydrology, Water balance, Water resources, Precipitation(Meteorology), Earth resources program, Models, Maximum likelihood estimates, Infrared spectra.

The author has identified the following significant results. Methods of manual, semi-automatic, and automatic (computer) data processing were evaluated, as were the requirements for spatial physiographic and limnological information. The coupling of specially processed ERTS data with simulation models of the watershed precipitation/runoff process provides potential for water resources management. Optimal and full use of the data requires a mix of data processing and analysis techniques, including single band editing, two band ratios, and multiband combinations. A combination of maximum likelihood ratio and near-IR/red band ratio processing was found to be particularly useful.

IRS-W-13 PC$4.50/MF$2.25
Institut fuer Reaktorsicherheit der Technischen Ueberwachungs-Vereine e.V., Koeln (F.R. Germany).
Reassessment of the Parameters Used to Predict the Environmental Transport of exp 131 I from Air to Milk. A Supplement to Irs-W--6.
F. O. Hoffman. Apr 75, 28p
U.S. Sales Only.

Descriptors: (*Iodine 131, *Radioecological concentration), (*Food chains, *Radionuclide kinetics), Cows, Environment, Errors, Forage, Land pollution, Man, Milk, Radiation monitoring, Radionuclide migration, Seasonal variations, Surface air.

For abstract, see NSA 32 03, number 06442.

IS-3613 PC$7.25/MF$2.25
Ames Lab., Iowa.
Environmental Monitoring at Ames Laboratory: Calendar Year, 1974.
M. D. Voss. May 75, 83p
Contract W-7405-eng-82

Descriptors: (*Ames laboratory, *Environment), (*Tritium, *Radiation monitoring), (*Sodium 22, Radiation monitoring), (*Zirconium 95, Radiation monitoring), Argon 41, Cerium 141, Chemical effluents, Chlorides, Chromium, Gaseous wastes, Liquid wastes, Monitoring, Radioactive waste management, Radioactivity, Ruthenium 103, Zinc.

For abstract, see NSA 32 03, number 06413.

JUL-1165 PC$11.50/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany).
Long-Term Aspects of the Environmental Burden from Energy Production: Co sub 2 and exp 3 H.
F. Niehaus. Feb 75, 167p
In German. U.S. Sales Only.

Descriptors: (*Nuclear power plants, *Radioactive waste disposal), (*Tritium, *Diffusion), (*Surface waters, *Contamination), (*Seas, Contamination), Distribution, Earth crust, Environment, Forecasting, Liquid wastes, Mathematical models, Mixing, Oceanography, Radioactive effluents, Radioactivity, Radionuclide migration, Tracer techniques, Biological effects, Carbon dioxide, Chemical effluents, Earth atmosphere, Fossil-fuel power plants, Temperature control, Time dependence, Waste disposal.

For abstract, see NSA 32 03, number 06405.

K-L-6346 PC$4.00/MF$2.25
Oak Ridge Gaseous Diffusion Plant, Tenn.
Uranium Handling at the Oak Ridge Gaseous Diffusion Plant.
J. C. Bailey. 7p CONF-750445-1

Descriptors: (*Orgdp, *Personnel dosimetry), (*Uranium hexafluoride, *Health hazards), (*Personnel, *Radiation protection), Materials handling, Photographic film detectors, Radiation monitoring, Radiometric analysis, Uranium, Uranium 235, Urine, Whole-body counting, Working conditions.

For abstract, see NSA 32 03, number 06427.

LA-5977-PR PC$5.45/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Environmental Surveillance at Los Alamos During 1974.
K. E. Apt, and V. J. Lee. May 75, 52p
Contract W-7405-eng-36

Descriptors: (*Lasl, *Environment), (*Surface air, *Radiation monitoring), (*Ground water, Radiation monitoring), (*Surface waters, Radiation monitoring), Radioactive waste management, Radioactivity, Radionuclide migration, Sampling, Sediments, Soils.

For abstract, see NSA 32 03, number 06415.

MLM-2232 PC$4.00/MF$2.25
Mound Lab., Miamisburg, Ohio.
Annual Environmental Monitoring Report: Calendar Year 1974.
D. G. Carfagno, and B. Robinson. 30 Apr 75, 40p
Contract AT-33-1-GEN-53

Descriptors: (*Mound laboratory, *Environment), (*Polonium 210, *Radiation monitoring), (*Plutonium 238, Radiation monitoring), (*Tritium, Radiation monitoring), Food, Monitoring, Nonradioactive waste disposal, Radioactivity, Sampling, Silt, Soils, Surface air, Surface waters.

For abstract, see NSA 32 03, number 06416.

NP-20415 PC$4.25/MF$2.25
Atomenerjisi Komisyonu, Ankara (Turkey).
Radioactive Fallout Report for 1974.
N. Kahraman, G. Baycan, and N. Saygili. Mar 75, 21p
In English and Turkish. U.S. Sales Only.

Descriptors: (*Turkey, Fallout), (*Fallout, *Radiation monitoring), (*Beta sources, Radiation monitoring), (*Strontium 90, Radiation monitoring), Cesium 137, Environment, Milk, Rain, Sampling, Strontium 89, Surface air.

For abstract, see NSA 32 03, number 06417.

PB-243 387/8GA PC$3.75/MF$2.25
Geological Survey, Menlo Park, Calif. Water Resources Div.
Hydrologic Evaluation of the Haystack Butte Area with Emphasis on Possible Discharge of Class-I Wastes, Edwards Air Force Base, California.
Water-Resources investigations (Final),
Jerry L. Hughes. Apr 75, 39p USGS/WRI-7-75, USGS/WRD-75/039

Descriptors: *Sludge disposal, *Hydrogeology, *Ground water, Hydraulic conductivity, Water wells, Ground water recharge, Petrography, Water pollution, Water flow, Water quality, Water table, Water analysis, California, Arid land.
Identifiers: Edwards Air Force Base, Water quality data.

The discharge of three acre-feet per year of Class-I wastes to the Haystack Butte area of Edwards Air Force Base, Calif., has been proposed. Fifteen test holes indicate that ground water occurs mostly in volcanic and sedimentary rocks overlying quartz monzonite at a depth of about 100 feet below land surface. Hydraulic conductivity of cores of tertiary rocks taken from a test hole at depths of 9 to 88 feet below land surface suggests values of 0.000069 to 0.0049 feet per day. Petrographic analyses of the cores indicated mostly weathered volcanic rocks with montmorillonite clay. The water-level gradient averages about four feet per mile. After leaving the basin, the underflow becomes part of a regional flow system. The quality of the ground water is generally unsuitable for most purposes and suggests slow circulation in a geologic environment with soluble minerals.

PB-243 410/8GA PC$4.25/MF$2.25
Geological Survey, Richmond. Va. Water Resources Div.
A Predictive Computer Model of the Lower Cretaceous Aquifer, Franklin Area, Southeastern Virginia.
Water-resources investigations (Final),
Oliver J. Cosner. Apr 75, 72p USGS/WRI-51-74, USGS/WRD-75/041
Prepared in cooperation with Virginia State Water Control Board, Richmond.

Descriptors: *Aquifers, *Hydrogeology, *Ground water recharge, Finite difference theory, Mathematical models, Geologic structures, Water table, Ground water, Systems analysis, Drawdown, Dewatering, Permeability, Water wells, Pumping, Depth, Water flow, Virginia.
Identifiers: Franklin(Virginia), Natural recharge, Infiltration rates.

The Lower Cretaceous aquifer in Southeastern Virginia was simulated by a finite-difference digital model. The area modeled is centered at Franklin, Va. The aquifer is about 600 ft (180 m) thick there, and is estimated to be 2,000 ft thick 35 mi (56km) to the east. The aquifer consists of alternating permeable and semipermeable sand, gravel, silt and claybeds, and it is overlain by a semipermeable confining bed. Transmissivity is about 19,000 cu/ft/day/ft (1,899 cu m/day/m) at Franklin, decreasing to the west and increasing to the east. A prepumping water-level surface was developed by model-

ing. The use of a modeling factor (T/K'), transmissivity over vertical permeability of the confining bed, is described. Simulation runs to 1941, 1970, 1972 are in good agreement with historical data. Predictive runs show that if pumpage continues to increase, dewatering will occur at Franklin. If pumpage does not increase, additional drawdown will be small.

PB-243 412/4GA PC$3.25/MF$2.25
Geological Survey, Menlo Park, Calif. Water Resources Div.
Estimate of Sediment Discharges, Santa Ana River at Santa Ana and Santa Maria River at Guadalupe, California.
Water-resources investigations (Final),
Carl G. Kroll. Feb 75, 25p USGS/WRI-40-74, USGS/WRD-75/037
Prepared in cooperation with California State Dept. of Navigation and Ocean Development, Sacramento.

Descriptors: *Sediment transport, *Santa Ana River, *Santa Maria River, Suspended sediments, Beach erosion, Particle size, Bed load, Stream flow, Diurnal variations, Floods, California.
Identifiers: Santa Ana(California), Guadalupe(California).

During the water years 1968-71, the mean daily suspended-sediment discharge of the Santa Ana River at Santa Ana, Calif., was 7,400 tons, and the mean daily coarse-sediment discharge was 3,400 tons. Extrapolated over the 31 water years 1941-71 of streamflow record, the mean daily values are 1,200 and 620 tons. In the Santa Maria River at Guadalupe, Calif., during the water years 1969-71, the mean daily suspended-sediment discharge was 8,700 tons and the mean daily coarse-sediment discharge was 5,500 tons. The estimated long-term coarse-sediment discharge of the Santa Ana River is 620 tons per day or 190,000 cubic yards per year, and that of the Santa Maria River is 830 tons per day or 250,000 cubic yards per year. Only during floodflow is any significant quantity of sediment transported. In the Santa Maria River an estimated 99% of all coarse sediment was transported in 1% of the 31-year period.

PB-243 515/4GA PC$4.25/MF$2.25
Wisconsin Univ., Madison. Water Resources Center.
The Effect of Sulfate and Manganese Dioxide on the Release of Phosphorus from Lake Mendota Sediments.
Technical completion rept.,
Donald M. Olson. Jun 75, 52p WIS-WRC-75-05 W75-09619, OWRT-A-035-WIS(1)
Contracts DI-14-31-0001-3050, DI-14-31-0001-3250

Descriptors: *Water pollution, *Phosphorus, *Lake Mendota, *Sediments, Sulfates, Manganese oxides, Iron, Anaerobic conditions, Oxidation, Inorganic phosphates, Test methods, Laboratories, Wisconsin.
Identifiers: Hypolimnion, *Eutrophication.

The recommendation of the National Technical Advisory Committee to the Secretary of the Interior to limit the addition of sulfate or manganese oxide to lakes containing iron in the hypolimnion was evaluated by laboratory experiments in which Lake Mendota sediments were placed in carboys and incubated in the presence of various amounts of sulfate and manganese dioxide. Differences were noted in the quantity of orthophosphate released under anaerobic conditions between carboys that received 1 and 5 mg/l Mn02 and 0 and 10 mg/l Mn02. A direct relationship was observed between the quantity of added Mn02 and Mn(II) concentration. The addition of sulfate did not show a direct relationship to the quantity of orthophosphate released under anaerobic conditions.

PB-243 517/0GA PC$4.25/MF$2.25
Utah Water Research Lab., Logan.
Regional Analyses of Runoff Characteristics for Small Urban Watersheds.
Completion rept.,
George B. Shih, J. Paul Riley, and Eugene K. Israelsen. Apr 75, 67p PRWG-87-1 W75-09621, OWRT-B-047-UTAH(1)
Contract DI-14-31-0001-3340

Descriptors: *Storms, *Surface water runoff, *Urban areas, Mathematical models, Hydrology, Rainfall, Flood forecasting, Regression analysis, Soil properties, Correlation techniques, Computerized simulation, Drainage, Texas, Computer programs, Confidence limits.
Identifiers: *Urban hydrology, *Storm water runoff.

A general method was developed for estimating runoff rates and associated confidence limits of a given recurrence interval for ungaged small urban watersheds. The utility of the method was demonstrated through its application to a southeast region of Texas. Some 200 historical rainfall-runoff events from 40 watersheds in Houston, Austin, Dallas, and Fort Worth urban areas were analyzed. Watershed data such as drainage area, percent of urbanized area, channel length, average channel slope, land slope, and soil type are documented. Total rainfall amounts, intensities, durations, and mass-time distributions were determind for each storm and used to develop a rainfall generating model. Peak runoff, total runoff volume, and runoff duration are also determined. Statistical analyses were performed to develop regression models to relate peak runoff and total runoff volume with rainfall and watershed characteristics as independent variables. An urban watershed runoff model, based on the Utah Simulation Model, was used to identify the model parameters for each watershed by reproducing the historical storms. Relationship between model parameters was measured watershed variables were established.

PB-243 642/6GA PC$5.25/MF$2.25
Geological Survey, Raleigh, N.C. Water Resources Div.
Hydrology of the Albemarle-Pamlico Region North Carolina. A Preliminary Report of the Impact of Agricultural Developments.
Final rept.,
Ralph C. Heath. May 75, 107p USGS/WRI-9/75, USGS/WRD-75/045
Prepared in cooperation with North Carolina Dept. of Natural and Economic Resources, Raleigh.

Descriptors: *Swamps, *Drainage, *Hydrogeology, *Albemarle Sound, *Pamlico River, Water quality, Land use, Clearing, Peat, Farm management, Surface waters, Ground water, Runoff, Precipitation(Meteorology), Evapotranspiration, Water wells, Shellfish, North Carolina.
Identifiers: Storm water runoff.

Extensive agricultural land clearing and drainage operations underway in a 650 square mile part of the Albemarle-Pamlico region--a 1,634 square mile peninsula in North Carolina lying between Albemarle Sound on the North and the Pamlico River on the south--are changing the hydrology of the area. The artificial drainage system being constructed in the region, although it will probably result in only a slight modification of the natural annual evapotranspiration overland runoff, and ground-water discharge, will likely result in several important problems. First, changes in the water quality of the sounds and estuaries resulting from the rapid runoff of storm waters may prove harmful to the fishery resources. Second, lowering of the water table may cause relatively rapid subsidence of the land surface in an irregular pattern in the extensive areas underlain by thick peat deposits as a result of biochemical oxidation, peat fires, and wind.

PB-243 732/5GA PC$4.75/MF$2.25
Geological Survey, Menlo Park, Calif. Water Resources Div.
Ground-Water Hydrology of Northern Napa Valley California.
Final rept. 1971-72,
Robert E. Faye. Nov 73, 88p USGS/WRI-13-73, USGS/WRD-75/046
Prepared in cooperation with Napa County Flood Control and Water Conservation District, Calif.

Descriptors: *Ground water, *Hydrology, *Napa Valley, Hydrogeology, Aquifers, Rainfall, Base flow, Runoff, Models, Salinity, Droughts, Sodium chloride, Water analysis, Hydraulic conductivity, Water storage, Geothermy, Water table, California.

A model study of the alluvium in northern Napa Valley indicates that the alluvial aquifer is capable of supplying most of the future water needs of the area. Part of the hydrologic budget for the alluvium was derived from noting rainfall-runoff relations and rainfall and water-table recovery relations. Hydrothermal, sodium chloride ground water occurs in the northern part of Napa Valley and is only marginally suitable for irrigation. Model studies indicate that limited migration of sodium chloride water into intensively pumped parts of the alluvial aquifer probably will not be a serious problem.

PB-243 916/4GA PC$3.75/MF$2.25
Purdue Univ., Lafayette, Ind. School of Civil Engineering.
Removal of Periodicities by Differencing and Monthly Mean Substraction,
M. L. Kavvas, and J. W. Delleur. 1974, 30p W75-10352, OWRT-B-036-IND(4)

Descriptors: *Hydrology, *Time series analysis, Periodic variations, Analysis of variance, Stochastic processes.

The spectral representation of periodic hydrologic time series has both a continuous and a discrete part which represent the periodic and stationary random components, respectively. With this representation, season and non-seasonal differencing and monthly mean substraction methods for the removal of the periodic component were analyzed for the case of monthly series. It is shown both analytically and by an example that seasonal differencing removes and nonseasonal differencing effectively reduces the periodicity in the covariance function. However, both kinds of differencing greatly distort the original spectrum, wiping out the original spectral contribution at the origin and greatly reducing it near the origin. The fit to the distorted spectrum by ARMA models with few parameters is almost impossible and the fitted models are impractical for hydrologic simulation since they either yield an infinite variance or are undefined at the spectral origin. Subtraction of monthly means completely removes the periodicity in the covariance but introduces a different type of nonstationarity which is negligible for practical purposes.

RLO-2227-T12-53 PC$4.00/MF$2.25
Oregon State Univ., Corvallis School of Oceanography.
Radioactivity in Marine Organisms of the Northwest Coast of Baja California.
1974, 16p CONF-750221-1
In Spanish.

Descriptors: (*Molluscs, *Radioactivity), (*Pacific ocean, *Radiation monitoring), Mexico, Radioecological concentration, Radiometric analysis, Radionuclide kinetics, Radionuclide migration, Sampling.

For abstract, see NSA 32 03, number 06443.

SAND-75-0257 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Environmental Monitoring Report, Sandia Laboratories 1974.
W. L. Holley. May 75, 17p
Contract AT(29-1)-789

Descriptors: (*Sandia laboratories, *Environment), Monitoring, Nonradioactive waste disposal, Plants, Radiation monitoring, Radioactive waste management, Sampling, Surface waters.

For abstract, see NSA 32 03, number 06418.

SFL-A-20 PC$4.75/MF$2.25
Institute of Radiation Physics, Helsinki (Finland).
Role of Humic Substances in the Transport of Radionuclides.
A. Salo, and R. Saxen. Dec 74, 32p
U.S. Sales Only.

Descriptors: (*Aquatic ecosystems, *Radionuclide migration), (*Humus, *Chemical bonds), (*Metals, Chemical bonds), (*Radioisotopes, *Adsorption), Biological materials, Biological wastes, Chemical properties, Decomposition, Finland, Seawater, Surface waters.

For abstract, see NSA 32 03, number 06437.

SREL-3 PC$7.75/MF$2.25
Georgia Univ., Athens Inst. of Ecology.
Savannah River Ecology Laboratory Annual Report.
May 75, 92p
Contract AT(38-1)-819

Descriptors: (*Savannah river plant, *Ecology), (*Thermal effluents, *Biological effects), Leading abstract.

No abstract available.

TID-26782 PC$4.00/MF$2.25
Arkansas Univ., Fayetteville Dept. of Chemistry.
Exp 141 Ce, exp 144 Ce Activities Measured in Rain Samples at Fayetteville, Arkansas from January 1973--June 1974.
R. W. Holloway. 1974, 5p

Descriptors: (*Fallout, *Radiation monitoring), (*Cerium 144, Radiation monitoring), (*Cerium 141, Radiation monitoring), (*Arkansas, *Fallout deposits), China, Diffusion, Fission products, Nuclear explosions, Rain, Sampling, Time dependence.

For abstract, see NSA 32 03, number 06422.

TID-26812 PC$5.45/MF$2.25
Arkansas Univ., Fayetteville Dept. of Chemistry.
Radioactive Strontium and Barium Fallout at Fayetteville, Arkansas from October 1958--June 1974.
N. G. Sumerlin. 1975, 43p

Descriptors: (*Fallout, *Radiation monitoring), (*Strontium 89, Radiation monitoring), (*Strontium 90, Radiation monitoring), (*Barium 140, Radiation monitoring), Arkansas, Fallout deposits, Rain, Sampling, Snow.

For abstract, see NSA 32 03, number 06423.

UCSD-34P84X9 PC$4.00/MF$2.25
California Univ., La Jolla, San Diego Dept. of Chemistry.
Marine Geochemistry Research. Progress Report.
E. D. Goldberg. 11 Mar 75, 6p
Contract AT(04-3)-34

Descriptors: (*Plutonium 239, *Radiation monitoring), (*Plutonium 240, Radiation monitoring), (*Plutonium 238, Radiation monitoring), (*Lead 210, Radiation monitoring), Fallout, Pacific ocean, Radionuclide migration, Sediments, Strontium 90.

For abstract, see NSA 32 03, number 06438.

UH-226X10 PC$6.25/MF$2.25
Hawaii Univ., Honolulu.
Enewetak Marine Biological Laboratory 1973--1974 Annual Report. Final Report.
1974, 61p
Contract AT(29-2)-226

Descriptors: (*Eniwetok, *Ecology), (*Corals, *Chemical composition), (*Strontium 90, *Radiation monitoring), (*Birds, Ecology), Algae, Animals, Aquatic ecosystems, Coastal waters, Communities, Crustaceans, Fishes, Food, Food chains, Invertebrates, Molluscs, Population dynamics, Retention, Seas, Shores, Skeleton, Terrestrial ecosystems, Tropical regions.

For abstract, see NSA 32 03, number 06444.

ZJE-157 PC$7.00/MF$2.25
Skoda, Plzen (Czechoslovakia).
Atmospheric Dispersion of Ordinary and Radioactive Impurities.
O. Veverka, and K. Vlachovsky. 1975, 79p
U.S. Sales Only.

Descriptors: (*Earth atmosphere, *Radionuclide migration), (*Radioactive aerosols, *Diffusion), Computer calculations, Computer codes, Environment, Equations, Gaseous wastes, M codes, Mathematical models, Meteorology, Particle size, Radioactive effluents, Radioactivity, Statistics, Turbulence, Wind.

For abstract, see NSA 32 03, number 06409.

8I. Mining Engineering

COM-75-11026/2GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.
Impacts of Offshore Oil on North East Scotland,
John Hutton. 1 Jun 75, 33p MITSG-75-15 NOAA-75070804
Prepared in cooperation with North East Scotland Development Authority, Aberdeen.

Descriptors: *Scotland, *Oil recovery, *Offshore drilling, Industries, Social effect, Manpower, Regional planning, North Sea, New England.
Identifiers: Sea Grant program.

Massachusetts, along with other New England states, will face great economic, social, and environmental challenges from proposed offshore oil development on Georges Bank and the Outer Continental Shelf beyond Cape Cod. Northeast Scotland has faced, and to some extent resolved, similar challenges created by the rapid construction of facilities for extracting, processing, and transporting petroleum from the rich North Sea oil fields. To acquaint New England with northeast Scotland's experiences and problems in coping with the onshore impacts of offshore oil development, the MIT Sea Grant Program sponsored this lecture by Mr. John Hutton of the North East Scotland Development Authority.

NP-20303 PC$9.00/MF$2.25
Universidad Autonoma de Chihuahua (Mexico). Escuela de Ingenieria.
Methods of Operation El Nopal Mine.
J. J. de la Vega C.. 1973, 119p
In Spanish. U.S. Sales Only.

Descriptors: (*Mexico, Uranium ores), (*Uranium ores, *Geology), (*Uranium mines, *Operation), Mining, Ore processing.

For abstract, see NSA 32 03, number 06399.

PAT-APPL-491 726/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Method for Removal of Methane from Coalbeds.
Patent Application,
Filed 25 Jul 74, 17p DOCKET/MIN-2201
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Boreholes, *Coal mines, Methane, Mine gases.
Identifiers: PAT-CL-299-11, *Mine safety.

The patent application presents a method for removing methane gas from underground coalbeds prior to mining the coal. This comprises of drilling at least one borehole from the surface into the coalbed. The borehole is started at a slant rather than directly vertically, and as it descends, a gradual curve is followed until a horizontal position is reached where the desired portion of the coalbed is intersected. Approaching the coalbed in this manner and fracturing the coalbed in the major natural fraction direction cause release of large amounts of the trapped methane gas.

PAT-APPL-504 468/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Acoustic Method and Apparatus for Determining Effectiveness of Mine Passage Seal.
Patent Application,
11 Sep 74, 20p DOCKET/MIN-2297
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fire fighting, *Patent applications, *Sonic tests, Barriers, Seals(Stoppers), Mines(Excavations), Tunneling(Excavation), Effectiveness.

The patent application relates generally to an apparatus and method for determining the effectiveness of a seal in an underground mine passage, and more particularly, to a method and apparatus for determining the effectiveness of a seal designed to extinguish coal mine fires by using acoustic energy.

PAT-APPL-550 099/GA PC$3.25/MF$2.25
Energy Research and Development Administration, Washington, D.C.
Method and Apparatus for Measuring Incombustible Content of Coal Mine Dust Using Gamma-Ray Backscatter.
Patent Application,
Frederick E. Armstrong. Filed 14 Feb 75, 24p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Coal dust, *Patent applications, *Gamma counters, Coal mines, Gamma ray scattering, Backscattering, Combustion, Particles, Detection, Americium isotopes.
Identifiers: Incombustion, Mine safety, Americium 241.

The patent application describes the method and apparatus for measuring incombustible content of particulate material, particularly coal mine dust. It includes placing a sample of the particulate material in a container to define a pair of angularly oriented surfaces of the sample, directing an incident gamma-ray beam from a radiation source at one surface of the sample and detecting gamma-ray backscatter from the other surface of the sample with a radiation detector having an output operating a display to indicate incombustible content of the sample.

PAT-APPL-572 496/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Remote Sealing of Mine Passages.
Patent Application,
Kenneth R. Maser. Filed 25 Apr 75, 22p*
DOCKET/MIN-2296
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Barriers, *Patent applications, Mines(Excavations), Tunnels, Passageways, Seals(Stoppers), Sealing, Fire fighting, Boreholes, Fly ash, Foam, Expansion, Polyurethane resins, Cellular plastics, Injection.

The patent application relates to mine passages which are sealed remotely from the surface by drilling a borehole from the surface to intersect a mine passage. Fly ash is then pneumatically injected down the borehole in dilute phase at high velocity to form a partial seal obstructing more than 90 percent but less than 99 percent of the area of the mine passage. The emplaced fly ash displays the form of a conical pile with the flanking slopes curving concavely upward to the lips of a crater formed beneath the injection borehole. Sealing is then completed by injection of an expanding foam into the crater area.

PATENT-3 862 028
Not available NTIS
Department of Agriculture, Washington, D.C.
Flotation-Beneficiation of Phosphate Ores.
Patent,
Duane A. Jones, and Wesley A. Jordan. Filed 20 Nov 73, patented 21 Jan 75, 5p PAT-APPL-417 645,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Graft polymerization, *Flotation reagents, *Depressing reagents, Silicon dioxide, Phosphate deposits, Starches, Quaternary ammonium salts.
Identifiers: PAT-CL-209-166.

An improved method of separating minerals from phosphate ores is described. The addition of silica depressants to flotation slurries substantially increases the efficiency of mineral separation and thereby reduces the number of flotation steps required to obtain a good yield of ore having the desired mineral concentration.

PB-243 227/6GA PC$3.75/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Oil and Gas Statistics.
Advanced Indicators of Oil and Gas Exploration and Drilling Activity.
Aug 74, 38p* FEA/C-74/29

Descriptors: *Natural gas, *Petroleum geology, *Reserves, Exploration, Geophysical prospecting, Drilling, Petroleum engineering, Graphic methods, Production, United States.

This report is basically a graphic presentation of historical and current trends in petroleum exploration and drilling activity in the United States. Statistical information on domestic geophysical exploration, drilling rig activity, well completions and footages, production, and reserves can be obtained from numerous 'primary' and 'secondary' sources. This paper incorporates only a portion of available data, mainly that deemed useful in establishing trends in these areas. In order to assure accuracy of statistics presented in this report, primary sources were sought for all data. An itemized listing and discussion of data sources are included in Appendices A and B, respectively. In most instances the year 1950 was chosen as an initial date for historical data because it encompasses peak periods of exploration and drilling activity which occurred during the early and mid-1950's.

PB-243 340/7GA PC$4.25/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
The Impact of State and Federal Law on Development of Geothermal Resources in Texas.
Final rept.,
Tom Edwards. 15 Oct 74, 56p NSF/RA/N-74-244
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Texas State Office of the Attorney General, Austin.

Descriptors: *Geothermal resources, *Texas, *Government policies, *Energy policy, Law(Jurisprudence), Decisional law, Legislation, Regulations, National government, State government.

Geothermal resources under Texas property law: ownership, development, and regulation; Effect of prior mineral conveyances; Legal status of geothermal resources on state lands; Regulation of geothermal production under existing state law; Relevant federal law.

PB-243 342/3GA PC$4.25/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
An Analysis of the Potential Use of Geothermal Energy for Power Generation Along the Texas Gulf Coast.
Final rept.,
John S. Wilson, Burchard P. Shepherd, and Sidney Kaufman. 15 Oct 75, 70p NSF/RA/N-74-246
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Dow Chemical Co., Midland, Mich.

Descriptors: *Geothermal energy conversion, *Texas, Geothermal resources, Electric power generation, Cost analysis, Forecasting.

This report evaluates the possible potential energy resource represented by deep geopressured waters found along the Texas Gulf Coast. The nature and extent of the resource, along with the methods and the economics of power production, are estimated.

PB-243 347/2GA PC$4.75/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Assessment of Enhanced Recovery Technology as a Means for Increasing Total Crude Oil Recovery in Texas.
Final rept.,
E. Alan Lohse. 6 Jan 75, 78p NSF/RA/N-74-251
Grants NSF-GI-44085, NSF-SIA73-05812
Also pub. as Gulf Universities Research Consortium, Galveston, Tex., GURC-141.

Descriptors: *Crude oil, *Texas, *Oil recovery, Miscible displacement, Thermal recovery methods, Water drive, Assessments, Appraisals.
Identifiers: *Enhanced oil recovery, Technology assessment.

Enhanced recovery (ER) refers to chemical and/or thermal treatment of oil reservoirs to increase the production of crude oil beyond those amounts recoverable by natural reservoir energy (primary recovery, by water drive or gas pressure) or by artificial maintenance of reservoir energy (secondary recovery by waterflood or gas injection). Current ER methods consist of (1) polymers to thicken reservoir water for more uniform sweep of water through the reservoir, (2) miscible fluids to reduce interfacial tension between the reservoir rock's very small pore spaces and the oil, or (3) heat applied in some form such as steam or underground combustion. Detailed analyses of 242 Texas oil fields as a representative sample of the Texas oil resource are presented.

PB-243 348/0GA PC$3.75/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Assessment of Enhanced Recovery Technology as a Means for Increasing Natural Gas Recovery in Texas.
Final rept.,
E. Alan Lohse. Dec 74, 45p NSF/RA/N-74-252
Grants NSF-GI-44085, NSF-SIA73-05812
Also pub. as Gulf Universities Research Consortium, Galveston, Tex., GURC-142.

Descriptors: *Natural gas, *Fractured reservoirs, *Reservoir engineering, *Gas wells, *Gas production, *Texas, Reserves, Gas reservoirs, Hydraulics, Fracturing, Assessments, Appraisals.
Identifiers: Technology assessment, Enhanced gas recovery.

Discussed are enhanced recovery methods to create a system of under-ground fractures in a gas reservoir, thereby increasing the internal surface area through which gas can migrate through the reservoir rock into the well bore, at an increased rate sufficient to be of economic value.

PB-243 358/9GA PC$4.25/MF$2.25
LFE Environmental Analysis Labs., Richmond, Calif.
Handbook for Surveys of Inhalation Contaminants in Above Ground Coal Mining and Processing Work Areas.
21 Mar 75, 64p BuMines-OFR-52-75
Contract S0133022
See also PB-243 359.

Descriptors: *Air pollution, *Coal mining, *Hazards, *Industrial medicine, *Gas analysis, Manuals, Preventive medicine, Gas sampling, Contaminants, Safety, Standards, Safety devices, Mine gases, Protective clothing, Respiratory diseases, Toxicity, Fumes, Surface mining, Tables(Data).

The objective of this handbook is to provide the inspector with guidance for recognizing hazards from inhalation in above ground work areas of underground and surface coal mining and processing facilities and evaluating these hazards by collecting samples or making field determinations and interpreting the analytical results. Portions of the handbook that should prove most useful to inspectors include a survey check list, rules for determining if sampling is required, list of most frequently encountered contaminants, list of candidate contaminants and their sampling conditions, interpretation of results, and a procedure for a health and safety inspection.

PB-243 359/7GA PC$3.75/MF$2.25
LFE Environmental Analysis Labs., Richmond, Calif.
Handbook for Surveys of Inhalation Contaminants in Above Ground Coal Mining and Processing Work Areas, (Condensed Version).
21 Mar 75, 28p BuMines-53-75
Contract S0133022
See also PB-243 358 and PB-243 360.

Descriptors: *Coal mining, *Hazards, *Gas analysis, *Industrial medicine, Manuals, Contaminants, Gas sampling, Preventive medicine, Monitoring, Safety, Safety devices, Standards, Mine gases, Respiratory diseases, Toxicity, Fumes, Surface mining, Air pollution.

The objective of this condensed handbook is to provide the inspector with guidance for recognizing hazards from inhalation contaminants in above ground work areas of underground and surface coal mining and processing facilities and evaluating these hazards by collecting samples or making field determinations and interpreting the analytical results. It should be

carried with the inspectors during their surveys. The complete handbook should be left in their offices except for Appendix II, which lists the compositions of products found in previous surveys. Portions of the condensed handbook that should prove most useful to the inspectors include a procedure for an industrial hygiene survey, survey check list, rules for determining if sampling is required, list of most frequently encountered contaminants, list of condidate contaminants and their sampling conditions, and interpretation of results.

PB-243 360/5GA PC$5.25/MF$2.25
LFE Environmental Analysis Labs., Richmond, Calif.
Determination of Air Contaminants in Above Ground Coal Mining and Processing Facilities.
Final rept.
21 Mar 75, 110p BuMines-OFR-51-75
Contract S0133022
See also PB-243 359 and PB-243 358.

Descriptors: *Air pollution, *Coal mining, *Hazards, *Industrial medicine, *Gas analysis, Manuals, Contaminants, Regulations, Government policies, Gas sampling, Safety, Coal preparation, Standards, Mine gases, Respiratory diseases, Toxicity, Fumes, Surface mining, Tables(Data), Surveys.
Identifiers: Air pollution detection.

Federal regulations require the Mining Enforcement and Safety Administration to regulate the exposure of workers to inhalation hazards in the surface work areas of coal mining and processing operations. This research involved determining candidate inhalation contaminants for surface work areas of coal mining and processing, selecting appropriate sampling and analytical methods, performing qualitative surveys of 56 representative surveys of 56 representative coal mining and and processing facilities, and preparing handbook to provide guidance for inspectors sampling for these contaminants. This report describes the work that was done to accumulate the information used in preparing the inspector's handbook. Specifically, it contains descriptions of the surveys performed, analytical results obtained from these surveys, findings and conclusions, and recommendations for additional research.

PB-243 392/8GA PC$4.75/MF$2.25
Ferrar (Terry A.) Associates, State College, Pa.
Legal and Economic Considerations in Federal Coal Leasing.
Terry A. Ferrar, Barry L. Myers, and George R. Neumann. Dec 74, 98p*
Sponsored in part by National Science Foundation, Washington, D.C. Office of Energy Research and Development Policy.

Descriptors: *Coal, *Government policies, *Energy policy, Leasing, Exploitation, Royalties, Contract terms, Payment, Land use, National government, Benefit cost analysis.

This report outlines the economic incentives that surround the coal industry in the western states (non-reservation lands), examines the legal constraints which define the scope of the federal action, and explores the operational cost effectiveness of various policy alternatives.

PB-243 432-04/GA PC$4.00/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Energy Statistics.
Monthly Petroleum Statistics Report. April 1975.
Apr 75, 16p FEA/C-75/317
Paper copy also available on subscription $30.00/year domestic, $40.00/year foreign as PB-243 432.

Descriptors: *Petroleum industry, *Crude oil, *Supply(Economics), Statistics, Periodicals, International trade, Fuel oil, Heating fuels, Gasoline, Dictionaries.

This is a combination in monthly form of two previously published weekly publications, the Weekly Petroleum Statistics Report and the Weekly Petroleum Situation Report. The Monthly Petroleum Statistics Report contains data on production, import and stocks of crude oil, motor gasoline, jet fuels, distillate fuel oil and residual fuel oil. It also provides regional breakdowns of data on refinery operations and graphs of data on petroleum imports, crude runs-to-stills, heating oil stocks, motor gasoline stocks, refinery acquisition costs of crude oil, well head prices of crude oil, and retail prices of gasoline, home heating oil and residual fuel. It has retained two features of its weekly predecessors: a 'Highlight' section, with analyses of important trends; and a glossary of definitions.

PB-243 432-05/GA PC$4.00/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Energy Statistics.
Monthly Petroleum Statistics Report. May 1975.
May 75, 15p
Paper copy also available on subscription $30.00/year domestic, $40.00/year foreign as PB-243 432.

Descriptors: *Petroleum industry, *Oil shale, *Supply(Economics), Statistics, Periodicals, Tables(Data).

This bulletin contains data on petroleum crude oil stocks and refinery products. It also includes an assessment of western oil shale.

PB-243 467/8GA PC$3.25/MF$2.25
Hawaii State Dept. of Planning and Economic Development, Honolulu. Geothermal Energy Policy Project.
State Policy Considerations for Geothermal Development in Hawaii,
Eugene M. Grabbe, and Robert M. Kamins. Apr 75, 24p NSF/RA/G-75/014
Grant NSF-ISR71-03844-A03

Descriptors: *Geothermal resources, *Government policies, *Hawaii, Geothermal prospecting, Geothermal exploration, State government.

This is a brief background report that outlines the various policy options open to Hawaii in developing its geothermal energy resources. Topics that are addressed included: uses of the resource; outcomes of exploration and development; constraints on geothermal drilling in Hawaii; State policies toward geothermal drilling and development; and, roles of state and county government in geothermal development.

PB-243 652/5GA PC$4.25/MF$2.25
Bureau of Mines, Spokane, Wash. Spokane Mining Research Center.
Limited Field Tests in Electrokinetic Densification of Mill Tailings.
Rept. of investigations Jul 72-Jul 73,
R. H. Sprute, and D. J. Kelsh. Jun 75, 52p
BuMines-RI-8034

Descriptors: *Tailings, *Solid waste disposal, *Backfills, *Densification, Electroosmosis, Electrochemistry, Electrokinetics, Consolidation, Dewatering, Water removal, Stope mining, Underground supporting, Mining engineering, Mine wastes.

Extensive laboratory testing has shown that electrokinetic densification can be an effective method for dewatering and consolidating unclassified metal mine mill tailings. This report describes results of a limited field test of this technique. Eighteen-cubic-yard concrete model stopes, 18 feet long by 6 feet deep by 56 inches wide, were filled with unclassified tailings slurry from a metal mine in the Coeur d'Alene, Idaho, district. Five different tests were performed. They showed that a strong, dense, dewatered fill can be obtained in a reasonably short timeusing electrokinetics, with typical power consumption of 25 to 30 kilowatt-hours per cubic yard of densified fill. At present power costs in the Coeur d'Alene district, this would amount to 10 to 12 cents per cubic yard.

PB-243 683/0GA PC$3.25/MF$2.25
Bureau of Mines, Twin Cities, Minn. Twin Cities Mining Research Center.
Effect of Depth of Cut and Bit Type on the Generation of Respirable Dust.
Rept. of investigations 1975,
Kelly C. Strebig, and H. William Zeller. Jun 75, 21p BuMines-RI-8042

Descriptors: *Coal mining, *Dust control, Mining equipment, Cutting machines(Tools), Coal dust, Human factors engineering.

Laboratory tests were conducted by the Bureau of Mines to determine the effect of depth of cut and bit types on respirable coal dust generation. Apparatuses were constructed to contain the coal samples, measure the linear cutting forces, and analyze the dust generated. Single-bit tests were conducted in Illinois No. 5 and Pittsburgh seam coals with five bit types at four depths of cut. The results showed that bit type did not significantly influence dust production. On the other hand, deep cutting bits were more efficient and generated substantially less respirable dust per pound of coal broken than shallow cutting bits.

PB-243 896/8GA PC$7.50/MF$2.25
Bolt Beranek and Newman, Inc., Cambridge, Mass.
Noise Control of Underground Diesel-Powered Mining Equipment.
Final rept. 28 Jun 74-17 Jan 75,
W. N. Patterson, G. G. Huggins, and A. G. Galaitsis. 23 Jan 75, 227p BBN-2979 BuMines-OFR-58-75
Contract H0346046

Descriptors: *Tunneling machines, *Mining equipment, *Noise pollution, *Industrial hygiene, *Underground mining, Noise reduction, Noise exposure, Acoustic measurement, Reflectivity, Reverberation, Mathematical models, Diesel engines, Housings, Mufflers, Vibration isolators.

The report surveys underground diesel-powered mining equipment and details their noise levels and subsequent worker noise exposure. The noise mechanisms for these machines is characterized and control techniques are discussed. Additionally, a method for predicting underground noise levels from surface measurements is presented.

8J. Physical Oceanography

AD-A013 654/9GA PC$3.25/MF$2.25
Oregon State Univ Corvallis School of Oceanography
EXPOSURE. A Newsletter for Ocean Technologists. Volume 3, Number 3.
Technical rept.,
Roderick Mesecar. Jul 75, 14p
Contract N00014-67-A-0369-0007
See also AD-A007 382.

Descriptors: *Oceanographic equipment, *Optical equipment, Underwater equipment, Temperature measuring instruments, Reliability, Water quality, Optical images, Aerial recon-

naissance, Buoys, Drift, Flowmeters, Test methods, Performance(Engineering), Depth finding, Ocean currents, Pack ice.
Identifiers: Random access measurement systems.

Contents:
Underwater optical target;
A lightweight profiling system;
A small drifting buoy for a moderately severe environment.

AD-A014 028/5GA PC$3.25/MF$2.25
Rosenstiel School of Marine and Atmospheric Science Miami Fla
Direct Measurement of the Specific Volume of Seawater from -2 to 40 C and from 0 to 1000 bars, Preliminary Results,
Robert T. Emmet, and Frank J. Millero. 14 Mar 74, 10p Rept no. Contrib-1772
Contract N00014-67-A-0201-0013, Grant NSF-GA-17386
Availability: Pub. in Jnl. of Geophysical Research, V79 n24 p3463-3472, 20 Aug 74.

Descriptors: *Sea water, *Specific volume, *Densimeters, Standards, Measurement, Magnetic devices, Salinity, Chlorine, Temperature, Hydrostatic pressure, Bulk modulus, Equations of state, Expansion, Compressive properties, Reprints.
Identifiers: Chlorinity, Magnetic float densimeters.

The densities of standard seawater (International Association of Physical Sciences of the Oceans) of 19.3755 parts/thousand chlorinity have been measured with a high-pressure magnetic float densimeter from -2 to 40 C and from 0 to 1000 bars. The results have been fitted to a second degree secant bulk modulus equation. The measured specific volumes are in excellent agreement, the results being calculated from the sound derived equation of state over the oceanic ranges of temperature and pressure. The smoothed specific volumes, expansibilities, and compressibilities from these direct measurements are compared with the results obtained by other workers.

JPRS-65189 PC$3.75/MF$2.25
Joint Publications Research Service, Arlington, Va.
Ocean Turbulence,
A. N. Paramonov, A. G. Kolesnikov, and A. S. Lezhen. 10 Jul 75, 31p
Trans. of mono. Problemy Poluchenlya i Obrabotki Informatsii o Fizicheskom Sostoianii Okeana, Sevastopol, 1967 p100-114 p126-132 p140-145.

Descriptors: *Ocean waves, *Turbulence, Towed bodies, Detectors, Temperature measurement, Electrical resistivity, Pressure, Analog to digital converters, Acoustic measurement, Optics, Statistical analysis, Translations, USSR.
Identifiers: Oceanographic equipment.

The report contains a description of a towed complex of hydrophysical apparatus, a method of investigating ocean turbulence and the statistical structure of turbulent fields of the ocean in the development of discrete analog-to-code converters.

JPRS-65197 PC$3.25/MF$2.25
Joint Publications Research Service, Arlington, Va.
Towed Hydrological Measuring System,
V. A. Gaiskii, A. V. Khokhlov, and V. F. Sytnikov. 10 Jul 75, 14p
Trans. of Morskie Gidrofizicheskie Issledovaniya (USSR) n3(59) p84-95 1972.

Descriptors: *Oceanographic data, *Towed bodies, Detectors, Salinity, Depth finding, Diagrams, Electrical resistivity, Design, Translations, USSR.
Identifiers: *Oceanographic equipment.

The report contains a description of a towed system designed to measure the parameters of hydrological fields while the ship is underway.

8K. Seismology

AD-A013 672/1GA PC$5.25/MF$2.25
Teledyne Geotech Alexandria Va Seismic Data Analysis Center
Detection of Long-Period S from Earthquakes and Explosions at LASA and LRSM Stations with Application to Positive and Negative Discrimination of Earthquakes and Underground Explosions.
Technical rept.,
R. Blandford, and D. Clark. 12 Dec 74, 124p
Rept no. SDAC-TR-74-15
Contracts F08606-74-C-0006, ARPA Order-1620

Descriptors: *Seismic waves, Discriminate analysis, Earthquakes, Nuclear explosions, Discrimination, Secondary waves, Rayleigh waves, Underground explosions, Seismic detection, Amplitude, Seismic data, Long range(Distance), Seismic arrays, Networks, Alaska, Seismological stations, Threshold effects, Global, Japan, USSR.
Identifiers: Shear waves, Large aperture seismic arrays, Long period seismic waves, Kurile Islands.

An improved distance-amplitude relation for long-period S waves is developed and applied to long-period S waves measured from megaton-range explosions. The difference between magnitude determined from the maximum amplitude long-period S waves and the magnitude determined from Rayleigh waves is found to be a good discriminant between worldwide earthquakes and explosions at NTS and Amchitka. The long-period SH/SV ratio is not a discriminant. The 90% incremental threshold for detection of earthquake long-period S waves at LASA from Japan and the Kuril Islands is m sub b = 5.2. Beamforming and program FKCOMB were found to be equal in detection capability. Previously reported data imply a 90% incremental threshold of m sub b = 4.7 for detection of long-period S waves at ALPA from the Kuril Islands and Kamchatka. The difference between LASA and ALPA capability can be explained by the average distance-amplitude relation together with the lower noise level at ALPA. For possible seismic network, the use of negative discriminants (no detection of S waves) with .01 probability of a false alarm for explosions is shown to result in an M sub s threshold approximately equal to the threshold of 90% probability of detection of S waves from earthquakes by two or more stations (positive discrimination). A significant lowering of the negative threshold is possible if one station of the network has an especially low detection threshold.

AD-A013 956/8GA PC$3.25/MF$2.25
California Inst of Tech Pasadena Seismological Lab
Interpretation of Body and Rayleigh Waves from NTS to Tucson,
Charles A. Langston, and Donald V. Helmberger. 11 Feb 74, 13p AFOSR-TR-75-1205
Contract F44620-72-C-0078, ARPA Order-1827
Availability: Pub. in Bulletin of the Seismological Society of America, v64 n6 p1919-1929 Dec 74.

Descriptors: *Seismic waves, *Nuclear explosion testing, Rayleigh waves, Seismic arrays, Arizona, Nevada, Arrival, Time dependence, Velocity, Seismic reflection, Earth mantle, Earth crust, Thickness, Poisson ratio, Earth models, Nuclear explosions, Underground explosions, Reprints.
Identifiers: Body waves, P waves, Oscuro shot, Group velocity.

A linear array of eight Caltech portable broadband seismograph trailers was set out from NTS to near Phoenix, Arizona, for the pre-announced underground nuclear test, OSCURO, on September 21, 1972. Travel-time and amplitude information were used to find an average crustal model by calculating synthetic seismograms using the Caniard-de Hoop method. Rayleigh waves from other nuclear events at NTS, as recorded at the Tucson WWSSN station, were examined as a control for determining the structure of the top half of the crust. Group-velocity curves were found and synthetic Rayleigh waves calculated for Tucson and Kingman (LRSM). The formations and characteristics of P sub n, a reflected P sub n, and the P sub g phases are examined. P sub g is demonstrated to be composed of the primary P reflection from the mantle and contains multiple arrivals of P-SV conversions. Comparisons of synthetic and observed seismograms indicate a crustal thickness of 30 km with a Poisson's ratio of 0.23. The crust-mantle transition appears to be sharp, jumping from 6.1 to 7.9 km/sec. The amplitude behavior of P sub n shows little evidence of any lid structure. (Author)

AD-A013 957/6GA PC$3.25/MF$2.25
California Inst of Tech Pasadena Seismological Lab
A Teleseismic Array Study in French Polynesia; Implications for Distant and Local Structure,
Emile Okal, and Guy Kuster. 23 Oct 74, 5p
AFOSR-TR-75-1206
Contract F44620-72-C-0078, ARPA Order-1827
Availability: Pub. in Geophysical Research Letters, v2 n1 p5-8 Jan 75.

Descriptors: *Seismic waves, Anomalies, Polynesia, Seismic arrays, Networks, Velocity, Azimuth, Structural geology, Short range(Distance), Earth crust, Earth models, Atolls, Hawaii, Reprints.
Identifiers: Tahiti.

This report analyzes slowness and azimuth anomalies, as recorded in the French Polynesia Seismic Network. The network can be considered as an array in its whole, or can be split into two subarrays, 350 km apart. In the former case, it is found that, contrary to Canadian VASA results, no anomaly is apparent for rays bottoming under Hawaii. In the latter case, a model of the crust is attempted under Tahiti as well as under the atoll of Rangiroa.

AD-A013 958/4GA PC$3.25/MF$2.25
California Inst of Tech Pasadena Seismological Lab
Focal Process of the Great Chilean Earthquake May 22, 1960,
Hiroo Kanamori, and John J. Cipar. 27 Aug 74, 11p Rept no. Contrib-2509 AFOSR-TR-75-1208
Contract F44620-72-C-0078, Grant NSF-GA-40752
Availability: Pub. in Physics of the Earth and Planetary Interiors, v9 p128-136 1974.

Descriptors: *Earthquakes, *Epicenters, *Seismic waves, Seismographs, Chile, Seismic data, Faults(Geology), Thrust, Earth models, Mathematical models, Surface waves, Velocity, Sources, Focusing, Strain(Mechanics), Deformation, Time, Rupture, Rayleigh waves, Precursors, Shock waves, Resonance, Reprints.
Identifiers: Love waves, Earthquake 1960 Chile.

A long-period strain seismogram recorded at Pasadena is used to determine the focal process of the 1960 Chilean earthquake. Synthetic seismograms computed for various fault models are matched with the observed strain seismogram to determine the fault

parameters. A low-angle thrust model with rupture length of 800 km and rupture velocity of 3.5 km/sec is consistent with the observed Rayleigh/Love wave ratio and the radiation asymmetry. The strain seismogram clearly shows unusually long-period (300-600 sec) wave arriving at the P time of a large foreshock which occurred about 15 minutes before the main shock, suggesting a large slow deformation in the epicentral area prior to the major failure. A simple dislocation model shows that a dislocation of 30 m, having a time constant of 300-600 sec, over a fault plane of 800 x 200 sq km is required to explain this precursor displacement. The entire focal process may be envisaged in terms of a large-scale deformation which started rather gradually and eventually triggered the foreshocks and the 'main' shock. This mechanism may explain the large premonitory defomations documented, but not recorded instrumentally, for several Japanese earthquakes. The moments of the main shock and the precursor are large enough to affect the earth's polar motion.

AD-A013 959/2GA PC$3.25/MF$2.25
California Inst of Tech Pasadena Seismological Lab
Earthquake Source Dynamics from Farfield Amplitude and Plane Spectra of Body Waves,
Mansour Niazi. 4 Sep 73, 17p Rept no. Contrib-2384 AFOSR-TR-75-1207
Contract F44620-72-C-0078, ARPA Order-1827
Availability: Pub. in Geophysical Jnl. of the Royal Astronomical Society, v37 p31-44 1974.

Descriptors: *Seismic waves, *Earthquakes, *Faults(Geology), Spectrum analysis, Far field, Sources, Dislocations, Rupture, Time, Amplitude, Phase, Shear stresses, Azimuth, Shallow depth, Turkey, Iran, Reprints.
Identifiers: Body waves.

Farfield amplitude and phase spectra for a longitudinal shear fault with constant or linearly varying dislocation is considered. The spectral corner frequencies are explained in terms of two characteristic source times, related to the displacement time function and rupture time. The relative position of the latter corner frequency for P and SH waves are shown to be azimuth dependent, the P wave corner frequency being lower, in the half space toward which rupture front moves, and higher in the opposite direction. The structural features of the phase spectrum are shown to contain information relevant to the dynamics of faulting at the source. For unilateral faulting, the general trend of the phase spectrum exhibits as much sensitivity to rupture time as the position of the related corner frequency in the amplitude spectrum does. Assuming a cosine ramp displacement time function, the farfield amplitude and phase spectra are computed for trial source models of two shallow continental earthquakes in Turkey and Iran, and the results are compared with observations. It is concluded that simultaneous utilization of observed amplitude and phase spectra imposes additional constraints on the adopted source models, and may serve to discriminate between a predominantly unilateral and bilateral advancement of failure at the source. (Author)

AD-A014 016/0GA PC$3.25/MF$2.25
Nevada Univ Reno Seismological Lab
S-Wave Splitting: Key to Earthquake Prediction,
Alan Ryall, and William U. Savage. 14 Jan 74, 11p AFOSR-TR-75-1229
Contracts F44620-72-C-0069, AT(26-1)-454
Availability: Pub. in Bulletin of the Seismological Society of America, v64 n6 p1943-1951 Dec 74.

Descriptors: *Seismic waves, *Seismic signatures, *Secondary waves, Seismic data, Nevada, Earthquakes, Predictions, Shear stresses, Sources, Velocity, Anisotropy, Earth models, Earth crust, Spectrum analysis, Splitting, Phase, Reprints.

This paper presents a detailed analysis of S-wave data for two areas in western Nevada. Some of these data were used by Gupta as the basis for his claim that large premonitory changes in the extent of stress-induced S-wave splitting are observed for moderate-sized earthquakes in Nevada. Analysis of particle motion for an earthquake sequence near Slate Mountain indicates that changes in S-wave splitting did not occur during that sequence. For the Mina area, comparison of S-wave signatures for 158 events occurring over a 3-year period resulted in the identification of numerous events that would be considered anomalous by Gupta's criteria, but were not followed by larger earthquakes. The present state of knowledge on crustal structure and seismic source parameters in the western Basin and Range province is not sufficient to discriminate between stress-induced velocity anisotropy and the many other factors that contribute to the complexity of S-wave signatures.

PB-243 594/9GA PC$5.75/MF$2.25
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
Strong Motion Earthquake Accelerograms. Digitized and Plotted Data. Volume I. Uncorrected Accelerograms. Part X. Accelerograms IX355 through IX369. Accelerograms from the San Fernando, California, Earthquake of February 9, 1971,
A. G. Brady, and D. E. Hudson. Apr 75, 130p EERL-73-29
Grant NSF-GI-28098
See also PB-242 262.

Descriptors: *Earthquakes, *Seismic waves, *Spectrum analysis, Accelerometers, Damping, Digital techniques, Data processing, Analog to digital converters, Imperial valley, Lytle Creek, California.
Identifiers: *Earthquake engineering, Seismic spectra, Ground motion, *San Fernando earthquake, *Lytle Creek earthquake.

The first set of twenty uncorrected digitized earthquake accelerograms was published in July 1969 as Volume I, Part A, of the present series. That volume also contained introductory material and background information describing the methods used, accuracies, etc., which should be referred to by all users of the data. The 1971 San Fernando earthquake provided records of sufficient importance that the original plan was interrupted after two parts and Parts C through S contained the San Fernando earthquake accelerograms. This issue, Part X, contains data from the Lytle Creek, California, earthquake of September 12, 1970, and includes three records each from the buildings at 1640 Marengo, the Department of Water and Power, 808 S. Olive, and 646 S. Olive in Los Angeles; two records from the building at 445 Figueroa in Los Angeles; and a single record from Fire Station No. 78, a CWR site at Lake Hughes, No. 1.

PB-243 719/2GA PC$8.50/MF$2.25
California Inst. of Tech., Pasadena. Earthquake Engineering Research Lab.
Strong Motion Earthquake Accelerograms. Digitized and Plotted Data. Volume II. Corrected Accelerograms and Integrated Ground Velocity and Displacement Curves. Parts W and Y. Accelerograms IIW334-IIW336, IIW338, IIW339, IIW342-IIW345 and IIY370-IIY381,
D. E. Hudson, A. G. Brady, and M. D. Trifunac. Apr 75, 263p EERL-75-53
Grant NSF-AEN-71-01825
See also PB-242 948.

Descriptors: *Earthquakes, *Seismic waves, *Spectrum analysis, Accelerometers, Damping, Displacement, Digital techniques, Data processing, Analog to digital converters, Lytle Creek, Borrego Mountain, California.
Identifiers: *Earthquake engineering, Seismic spectra, Ground motion, *Borrego Mountain earthquake, *Lytle Creek earthquake.

The first set of twenty corrected earthquake accelerograms was published in September 1971, as Volume II, Part A, Report No. EERL 71-50, the first reports of the Volume II series. That issue also contained introductory material and background information describing the types of corrections used. The corresponding uncorrected data appeared earlier in Volume I, Part A, Report No. EERL 70-20. Both of these reports, containing references related to the records themselves and the various procedures, should be referred to by all users of the data. This issue, Volume II, Parts W and Y, Report No. EERL 75-53, is the last of this series of reports, and contains records from two Southern California earthquakes: Lytle Creek, September 12, 1970, and Borrego Mountain, April 8, 1968.

8L. Snow, Ice, and Permafrost

N75-26814/8GA PC$3.25/MF$2.25
Kansas Univ. Center for Research, Inc., Lawrence. Remote Sensing Lab.
A Theory of Wave Scatter from an Inhomogeneous Medium with a Slightly Rough Boundary and Its Application to Sea Ice.
S. K. Parashar, A. K. Fung, and R. K. Moore. Dec 74, 22p NASA-CR-141870, RSL-TR-177-53
Contract NAS9-10261

Descriptors: *Boundary layers, *Electromagnetic radiation, *Sea ice, *Wave scattering, Backscattering, Differential equations, Fourier transformation, Perturbation theory, Radar cross sections.

For abstract, STAR 1317

8M. Soil Mechanics

AD-A013 831/3GA PC$5.25/MF$2.25
Cold Regions Research and Engineering Lab Hanover N H
The Response of Frozen Soils to Vibratory Loads.
Technical rept.,
Henry W. Stevens. Jun 75, 104p Rept no. CRREL-TR-265

Descriptors: *Soil mechanics, *Soils, *Freezing, *Permafrost, *Cold regions, Loads(Forces), Stresses, Vibration, Viscoelasticity, Damping, Response, Physical properties, Structural engineering, Stress strain relations, Shear stresses, Wave propagation, Laboratory tests, Stress testing, Saturation, Soil dynamics, Cylinders, Computer applications.
Identifiers: *Frozen soils, Youngs modulus, Unfrozen soils.

This study was conducted to provide reliable values of the stiffness and damping properties of frozen soils subjected to vibratory loads and to define the significant factors affecting these parameters. A laboratory test was conducted on prepared specimens of frozen soils wherein a right circular cylinder was subjected to steady-state sinusoidal vibration. The material was considered to be linearly viscoelastic. Analysis of test data based on one-dimensional wave propagation yielded the complex Young's modulus, the complex shear modulus, the phase velocity of wave propagation, the shear velocity, the damping property expressed as the angle representing time lag between stress and strain, an attenuation coefficient, and a complex Poisson's ratio. The frequency of vibration was varied from 500 to 10,000 Hz, and the peak

dynamic stress was varied from 0.1 to 5.0 psi. Specimens were remolded or cored in-situ, frozen, and tested at temperatures of 0, +15 and +25 deg F. A few tests were conducted on identical soils nonfrozen. Tests results from a limited number of tests on selected soils indicate that the stiffness of these soils varies with the volume of ice/volume of soil ratio, and that ice is less stiff than saturated frozen soils. Frozen soils have stiffnesses up to 100 times those of identical soil nonfrozen. Depending upon the degree of ice saturation, the stiffness of non-saturated frozen soils varies from that of the saturated soils to nearly that of the nonfrozen soils. Stiffness increases with decreasing temperature but the rate is relatively low. As temperature rises and approaches the freezing point, stiffness abruptly decreases.

N75-26555/3GA PC$4.25/MF$2.25
Kansas Univ. Center for Research, Inc., Lawrence. Remote Sensing Lab.
Dielectric Properties of Soils as a Function of Moisture Content.
J. Cihlar, and F. Ulaby, T.. Nov 74, 61p NASA-CR-141868, RSL-TR-177-47
Contract NAS9-10261

Descriptors: *Dielectric properties, *Moisture content, *Soil science, *Soils, Data processing, Earth resources, Microwave sensors, Remote sensors.

For abstract, STAR 1317

PB-242 981/9GA PC$5.25/MF$2.25
Denver Univ., Colo. Dept. of Civil Engineering.
University-Industry Workshop on Behavior of Expansive Earth Materials.
Final rept.,
David A. Day, and O. Don Richard. Oct 74, 103p
Grant NSF-GK-40950
Supersedes PB-241 846.

Descriptors: *Soil mechanics, *Soil pressure, *Meetings, Uplift pressure, Swelling, Soil stabilization, Loads(Forces), Damage, Structures.
Identifiers: *Expansive soils, *Natural hazards.

The general objective of the workshop was to bring together approximately 30 engineers to jointly discuss the problems caused by expansive earth materials, the state-of-the-art of how to deal with them and to delineate research opportunities in this area which may lead to reductions in damage in the future. Among the areas discussed were: pavements, light buildings, heavy buildings, and other facilities (buried utilities, canals, dams, landslides, etc.).

8N. Terrestrial Magnetism

AD-A014 031/9GA PC$3.25/MF$2.25
Hawaii Inst of Geophysics Honolulu
Geochronology of the Neogene Paleomagnetic Polarity Epochs,
F. Theyer, and S. R. Hammond. 1975, 4p Rept no. HIG-Contrib-616
Contract N00014-70-A-0016-0001, Grant NSF-DES-74-19504
Availability: Pub. in Proceedings of the Congress (6th), International Union of Geological Sciences, Bratislava (Czechoslovakia), 4-7 Sep 75, v1 p303-305.

Descriptors: *Geomagnetism, *Geologic age determination, Stratigraphy, Magnetic properties, Polarization, Reversible, Paleontology, Radiolaria, Ocean bottom, Sediments, Correlation techniques, Reprints.
Identifiers: Paleomagnetism, Geochronology, Paleoclimatology.

The paper summarizes the chronology of the 21 paleomagnetic polarity epochs that comprise the Neogene (t=0-23.5 m.y.B.P.) and outlines their correlation with the radiolarian zonal boundaries. Relevant publications are mentioned and important future research projects are suggested.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-A013 857/8GA PC$3.75/MF$2.25
Dikewood Corp Los Angeles Calif
Impedances and Field Distributions of Two Coplanar Parallel Perfectly Conducting Strips with Arbitrary Widths.
Final rept. 29 May-20 Oct 74,
Tom K. Liu. Jul 75, 50p AFWL-TR-74-290
Contract F29601-74-C-0010

Descriptors: *Strip transmission lines, Electrical impedance, Distribution, Aircraft antennas.

Transmission lines in the form of two coplanar parallel conducting strips with arbitrary widths are studied. This kind of coplanar strip line finds application in many aircraft antennas. The geometrical impedance factor, which relates the characteristic impedance of the transmission line to the intrinsic impedance of the medium surrounding the strips, is plotted and tabulated. The field distributions of the strips are also plotted. Compared to a two-cylinder transmission line with the radii of the cylinders being equal to the strip widths and the cylinders being separated by the same distance as the strips, the geometrical impedance factor of the strips is larger than that of the cylinders by approximately a constant (ln 2)/pi.

AD-A013 924/6GA PC$13.00/MF$2.25
Sperry Rand Corp Salt Lake City Utah UNIVAC Defense Systems Div
Evaluation of Discrete Semiconductor Specifications. Volume III. Semiconductor Devices-Tests-Category Matrix.
Final rept. Mar-Nov 74,
Arnold H. Fanzoi, and Donald E. Brown. Jun 75, 552p RADC-TR-75-154-Vol-3
Contract F30602-74-C-0149

Descriptors: *Semiconductor devices, *Quality control, Specifications, Quality assurance, Reliability(Electronics), Semiconductor diodes, Transistors, Test methods.

The prescribed methodology for this program is through analysis of the detail specifications with recommendations for advancing requirements for technical evaluation including recommended quality and reliability. Approximately 90 detail specifications covering recommended semiconductor devices have been technically documented. Additional quality and reliability documents to support these specifications are proposed and included. These include advanced controls to assure more satisfactory devices with recommendations for supporting manuals to assist in uniform implementation. A survey of various military projects preferred parts, those chosen for new design and review of information from other sources was made. Discussion with the controlling office provided the basis for study of the detailed devices and appropriate characteristics.

AD-A013 930/3GA PC$4.25/MF$2.25
Systems Research Labs Inc Dayton Ohio
Charge Transfer Device Evaluation Facility Plan (Phase I).
Interim technical rept. Jan-Jun 74,
John Weinhold. Oct 74, 65p AFAL-TR-74-284
Contract F33614-73-C-1135

Descriptors: *Charge coupled devices, Images, Remote detectors, Infrared detectors.
Identifiers: Charge transfer devices, Remote sensing.

The requirements for initial testing of charge transfer imaging sensors in the electro-optical sensor evaluation facility of the Reconnaissance Sensor Development Branch of the Air Force Avionics Laboratory are presented. Descriptions of the physical nature and electrical characteristics of bucket brigade and charge coupled, charge transfer imaging devices are given. The measurement procedures for determining the characteristics of charge transfer imaging sensors important in reconnaissance missions are described. The characteristics described are spectral and integral response, fixed and random noise, spatial response, and electrical and mechanical properties.

AD-A013 935/2GA PC$3.25/MF$2.25
Princeton Univ N J Dept of Electrical Engineering
Study of Electronic Transport and Breakdown in Thin Insulating Films.
Semi-annual technical rept. no. 5,
Walter C. Johnson, and Wilmer R. Bottoms. Jan 75, 20p AFCRL-TR-75-0157
Contract F19628-72-C-0298, ARPA Order-2180
See also report dated Jan 74, AD-783 870.

Descriptors: *Integrated circuits, *Dielectric films, *Electron transport, Silicon dioxide, Silicon nitrides, Silicon, Ion implantation, Electron irradiation, Alumina, Charge carriers, Trapping(Charged particles).
Identifiers: Metal insulator semiconductors, *Dielectric breakdown, Hot electrons.

An overview is given of progress in the study of high-field electronic transport and dielectric breakdown in thin (1000-5000 A) insulating films on silicon. The principal results to date are on SiO2; also under study are Al2O3, Si3N4, and layered composites. The studies include corona-induced nondestructive breakdown, self-quenched breakdown, effects of electron irradiation, study of charge-carrier trapping, study of lateral nonuniformities, electron-beam probing of the insulator-semiconductor interface, and theoretical modeling of hot-electron distributions and of localized breakdown.

AD-A013 945/1GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Calculation of p-Type GaAs IMPATT Admittance.
Journal article,
Roger W. Sudbury, and Richard W. Laton. 20 Sep 74, 3p Rept no. JA-4361 ESD-TR-75-193
Contract F19628-73-C-0002
Availability: Pub. in IEEE Transactions on Electron Devices, vED-22 n5 p294-295 May 75.

Descriptors: *Impatt diodes, Gallium arsenides, Ionization, Electrons, P type semiconductors, Doping, Admittance, Holes(Electron deficiencies), Reprints.

The unequal ionization rates reported for holes and electrons in GaAs have been used to calculate the small-signal admittance for a complimentary p-type IMPATT diode. For the uniformly doped n and p device structures considered, the p-type structure is found to have significantly increased negative conductance. (Author)

AD-A013 946/9GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Propagation in Dielectric-Lined Square Waveguides.
Journal article,
Gerasimos N. Tsandoulas. 12 Sep 74, 5p Rept no. JA-4341 ESD-TR-75-191
Contract F19628-73-C-0002

Availability: Pub. in IEEE Transactions on Microwave Theory and Techniques, vMTT-23 n5 p406-410 May 75.

Descriptors: *Waveguides, *Propagation, Dielectric properties, Waveguide circulators, Bandwidth, Polarization, Phase shift, Reprints.

Symmetric structures such as circular and square waveguides may conveniently be used for dual polarization application. In this work the square waveguide with a dielectric lining of the same geometry is analyzed using a Galerkin-type method, with experimental verification. Modal characteristics, propagation constants, and bandwidth (BW) properties are outlined. Some interesting variations, depending on whether the value of the dielectric constant of the lining is higher or lower than that of the included material, are described and quantified to the extent possible by the accuracy of the method. (Author)

AD-A013 962/6GA PC$3.25/MF$2.25
California Univ San Diego La Jolla Dept of Physics
Isotope Effect in the Resistivity of Scandium Hydride,
Z. Fisk, and D. C. Johnston. 7 Apr 75, 3p
AFOSR-TR-75-1193
Contract F44620-72-C-0017
Availability: Pub. in Physics Letters, v53A n1 p39-40, 19 May 75.

Descriptors: *Electrical resistivity, Scandium compounds, Hydrides, Deuterium compounds, Temperature, Measurement, Reprints.

The temperature dependent resistivities of ScH2 and ScD2 differ by an Einstein term with theta E = 1600K and theta E over the square root of 2, respectively. (Author)

AD-A014 012/9GA PC$3.25/MF$2.25
University of Southern California Los Angeles Electronic Sciences Lab
Two-Port Cavity Resonator Low-Insertion-Loss Delay Line,
T. Joseph, and K. Lakin. 21 Nov 74, 3p AFOSR-TR-75-1156
Contract F44620-71-C-0067
Availability: Pub. in Applied Physics Letters, v26 n7 p364-365, 1 Apr 75.

Descriptors: *Delay lines, *Insertion loss, *Resonators, Solid state electronics, Cavities, Transducers, Reprints.
Identifiers: Unidirectional transducers, Interdigital transducers.

A delay line is described which uses a unidirectional tranducers, formed by placing a short interdigital transducer (IDT) adjacent to a grating reflector, to realize low insertion losses. Theoretical and experimental results are compared for a device with 10.5 finger pair transducers and 100 finger pair gratings. The measured insertion loss was 2.5 dB at 38.14 MHz. (Author)

AD-A014 042/6GA PC$4.25/MF$2.25
Research Triangle Inst Research Triangle Park N C
Transient Surface Damage and Latchup in CMOS Devices.
Final rept. 13 May 74-12 May 75,
M. Simons. Jun 75, 62p Rept no. RTI-43U-991
Contract N00014-74-C-0433

Descriptors: *Semiconductor devices, *Transient radiation effects, *Complementary metal oxide semiconductors, Radiation effects, Silicon dioxide, Surface properties, Annealing.

The work consists of concurrent studies of transient surface damage and latchup phenomena in irradiated CMOS devices. Isothermal V sub th annealing data are presented for CMOS 4007 inverters from 0.0001 to 0.001 sec after exposure to ionizing radiation pulses. Commercial and research samples prepared on bulk silicon as well as silicon-on-sappire substrates are evaluated. High and low temperature annealing data are used to develop extended room temperature annealing characteristics over the 0.000001 and 10 to the 8th power sec post exposure interval. Electrical measurements and radiation tests have been conducted on selected commercial CMOS devices in an assessment of their susceptibility to radiation-induced latchup. A latchup problem has been identified in four of the thirteen circuit types tested. Test results along with some techniques for avoiding latchup are discussed.

AD-A014 064/0GA PC$3.75/MF$2.25
RCA Corp Burlington Mass Government Communications and Automated Systems Div
Manufacturing Methods and Technology Program Automated Image Device Evaluator (AIDE).
Quarterly progress rept. no. 5, 1 Jan-31 Mar 75,
E. W. Ketler. 31 Mar 75, 37p
Contract DAAB05-74-C-2524
See also report dated Jan 75, AD-A008 031.

Descriptors: *Test equipment, *Image intensifiers(Electronics), Automation, Acceptance tests.

The purpose of the work is to establish a manufacturing method and technology program for Automated Image Device Evaluator (AIDE) which will provide a computer controlled test system capable of performing production acceptance testing of second generation image intensifier tubes at the manufacturer's plant. The report covers the work performed on the AIDE equipment task during the period 1 January - 31 March 1975. It presents a technical and physical description of the Development Model equipment design and configuration. The work accomplished during the quarter and the task schedules are also presented.

AD-A014 068/1GA PC$3.25/MF$2.25
Sprague Electric Co North Adams Mass
Production Engineering Measure for Improved Reliability of Metallized Polycarbonate Capacitors.
Quarterly rept. no. 29, 1 Aug-31 Oct 74,
Leonard Adelson, and H. G. Brandt. Nov 74, 16p
Contract DAAB05-67-C-2707
See also AD-A001 816.

Descriptors: *Thin film capacitors, Production engineering, Thermoplastic resins, Polycarbonates, Metallizing, Fixed capacitors, Reliability(Electronics), Life tests.
Identifiers: *Production engineering measures, Polysulfones.

The object of the production engineering measure is to improve production techniques for the manufacture of Metallized Polycarbonate and Metallized Polysulfone Capacitors to attain a maximum failure rate of 0.001% per 1000 hours with a 90% confidence level. The 11,550 Polysulfone Capacitors of the First Production Run completed the 10,000 hour Extended Life Test at +125C and at rated voltage in accordance with Specification MIL-C-39022, paragraph 4.6.18.3.1.

AD-A014 086/3GA PC$3.25/MF$2.25
Rockwell International Corp Anaheim Calif Electronics Research Div
Programmable Acoustic Surface Wave Tapped Delay Lines/Matched Filters.
Final rept.,
P. J. Hagon, and R. N. Seymour. Jul 75, 21p
Rept no. C74-1043/501
Contract N00014-74-C-0457

Descriptors: *Acoustic delay lines, *Matched filters, Acoustic waves, Surface waves, Correlators, Spread spectrum, Integrated circuits, Complementary metal oxide semiconductors, Silicon, Sapphire.
Identifiers: Acoustic surface waves, Silicon on sapphire.

The design, fabrication and performance of three programmable 32/64/128 acoustic surface wave tapped delay line matched filters are described. The devices were temperature stable ST cut quartz tapped delay lines in combination with silicon on sapphire integrated control circuit and external switches to allow correlation of spread spectrum biphase coded waveforms of 32, 64, and 128 chips at a 70 MHz IF frequency with 10 MHz chip rate.

CERN-75-4 PC$4.50/MF$2.25
European Organization for Nuclear Research, Geneva (Switzerland).
Comparison of the Radiation Damage of Electronic Components Irradiated in Different Radiation Fields.
K. P. Lambert, H. Schoenbacher, and M. Van de Voorde. 14 May 75, 26p
U.S. Sales Only.

Descriptors: (*Resistors, *Physical radiation effects), (*Capacitors, Physical radiation effects), (*Semiconductor diodes, Physical radiation effects), (*Transistors, Physical radiation effects), Accelerators, Cobalt 60, Comparative evaluations, Electrical properties, Electronic equipment, Gamma radiation, Integrated circuits, Neutrons, Operational amplifiers, Protons, Reactors.

For abstract, see NSA 32 03, number 06572.

COM-75-11071/8GA PC$3.75/MF$2.25
National Bureau of Standards, Washington, D.C. Electricity Div.
A Study of Air-Gap Breakdown at 28.5 Kilohertz.
Final rept.,
F. Ralph Kotter. 20 Jun 75, 43p NBSIR-75-731
Contract N00039-3316-7105

Descriptors: *Air gaps, *Dielectric breakdown, Electrical faults, Very low frequencies, Electrical insulators, Antennas.

Measurements of the electrical breakdown of both quasi-uniform and highly nonuniform-field air gaps at a frequency of 28.5 kHz are reported. Gaps between a variety of electrode geometries ranged from a few centimeters to over two meters in length. Breakdown voltages significantly below the corresponding 60 Hz values were observed with electrodes for which appreciable pre-breakdown discharges occurred, and a pattern of 'anomalous' flashovers at considerably lower than the normal breakdown voltages was noted with quasi-uniform field gaps. The results obtained appear to correlate well with the data found in the literature for higher frequencies but lower voltages. On the basis of the gap behavior observed, a prototype protective gas system designed for application to the tower base insulator assembly of a VLF (15 to 30 kHz) radio transmitter was tested and found satisfactory.

N75-26253/5GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
An Electrical Method for Studying Thyristor Turn-on Action.
A. M. Yague, M. M. Dorkel, and D. Esteve. Jul 75, 13p NASA-TT-F-16451
Contract NASW-2481
Tran-Transl. Into English from Onde Elec. (France), V. 54, Dec. 1974 p 523-528.

Descriptors: *Current density, *Switching circuits, *Thyristors, Graphs (Charts), P-n junc-

tions, Performance tests, Recombination reactions, Temperature effects.

For abstract, STAR 1317

N75-26315/2GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Liquid Neon Heat Transfer as Applied to a 30 Tesla Cryomagnet.
S. S. Papell, and R. C. Hendricks. 1975, 8p
NASA-TM-X-71712, E-8330
Conf-Presented at Cryog. Eng. Conf., Kingston, Ontario, 22-25 Jul. 1975.

Descriptors: *Cryogenic magnets, *Heat transfer, *Liquid neon, Critical pressure, Forced convection, High pressure, Magnet coils, Pressure vessels, Superconducting magnets.

For abstract, STAR 1317

PAT-APPL-589 233/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Solid State Current Transformer.
Patent Application.
D. L. Farnsworth. Filed 23 Jun 75, 11p NASA-CASE-MFS-22560-1
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Solid state devices, *Transformers, Networks, *Patent applications, Signal transmission.

A signal transformation network is described which exhibits a very low input impedance while maintaining a linear transfer characteristic when driven from a voltage source and when quiescently biased in the low microampere current range. In its simplest form, it consists of a tightly coupled two-transistor network in which a common emitter input stage is interconnected directly with an emitter follower stage to provide virtually 100 percent negative feedback to the base input of the common emitter stage. Bias to the network is supplied via the common tie point of the common emitter stage collector terminal and the emitter follower base stage terminal by a regulated constant current source. The output of the circuit is taken from the collector of the emitter follower stage.

PATENT-3 161 452 Not available NTIS
Department of the Army Washington D C
Mounting Adapter for Electrical Connectors.
Patent,
Calvin R. Salter, and Kenneth H. Pascoe. Filed 5 Sep 63, patented 15 Dec 64, 3p Rept nos. PAT-APPL-306 966,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electric connectors, *Adapters, *Patents, Miniature electrical equipment.
Identifiers: PAT-CL-339-131.

The patent relates to a quick mounting adapter for miniature electrical connectors and more specifically to an adapter which may be installed without requiring access to the underside of a plate or housing to which it is to be mounted.

PATENT-3 164 745 Not available NTIS
Department of the Army Washington D C
Sweep Collapse and Rotation Failure Alarm System for PPI Display Device.
Patent,
Abraham Shulman. Filed 2 May 61, patented 5 Jan 65, 5p Rept nos. PAT-APPL-119 757,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cathode ray tubes, *Warning systems, *Patents, Plan position indicators, Display systems, Sweep generators, Failure(Electronics).
Identifiers: PAT-CL-315-20.

The patent relates to a sweep collapse alarm system and more particularly to a system for protecting electron tubes such as cathode-ray tubes or the like against destructive electron beam current.

PATENT-3 165 651 Not available NTIS
Department of the Army Washington D C
Piezoelectric Crystal Apparatus.
Patent,
Rudolf H. Bechmann. Filed 1 Dec 59, patented 12 Jan 65, 3p Rept nos. PAT-APPL-856 623,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Crystal oscillators, *Patents, Piezoelectric crystals, Frequency, Stability, Coatings.
Identifiers: PAT-CL-310-9-7.

The patent relates to piezoelectric crystal plates used as oscillators, and particularly to special coating arrangements thereon to effect the excitation of the plates by an electric field parallel to the major surfaces thereof.

PATENT-3 171 048 Not available NTIS
Department of the Army Washington D C
Crystal Frequency Temperature Compensation.
Patent,
Eduard A. Gerber. Filed 7 Jun 63, patented 23 Feb 65, 3p Rept nos. PAT-APPL-286 433,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Crystal oscillators, *Temperature control, *Patents, Frequency, Stability, Resonant frequency, Temperature sensitive elements.
Identifiers: PAT-CL-310-8-9.

The patent relates to crystal temperature compensation and particularly to the use of temperature sensitive elements, in conjunction with a crystal, to compensate for its frequency variation with respect to temperature.

PATENT-3 745 404 Not available NTIS
Department of the Army Washington D C
Imaging Tube with Sensitivity Threshold.
Patent,
Munsey E. Crost. Filed 23 Jul 71, patented 10 Jul 73, 9p Rept nos. PAT-APPL-165 718,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Image tubes, *Patents, Threshold effects, Light, Intensity.
Identifiers: PAT-CL-315-11.

The patent describes an electron imaging device which is capable of recognizing, on an instantaneous basis, only those regions of a two-dimensional optical image having a light-intensity exceeding a preselected threshold and which is insensitive to regions of light-intensity less than said threshold.

PATENT-3 746 905 Not available NTIS
Department of the Army Washington D C
High Vacuum Field Effect Electron Tube.
Patent,
Joe Shelton, Jerry W. Hagood, and Ralph L. Norman. Filed 21 Dec 71, patented 17 Jul 73, 4p Rept nos. PAT-APPL-210 451,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electron tubes, *Patents, Field emission, Emitters, High vacuum.
Identifiers: PAT-CL-313-309.

The patent describes an improved electron tube which eliminates the need for a heated electron source and affords simplified construction. The tube, a high vacuum tube, is capable of operating over an extended range of electrical potentials. The electron tube operates on the principle of electric field effect emission for the electron source, requiring neither gas, vapor nor a heated electrode in its envelope. Two active elements, an emitter and a collector, are enclosed in an evacuated chamber with outside connections to each element. The collector is a metal plate and the emitter is an oxide-metal composite which contains a very large number of metal filaments embedded in an insulating oxide matrix.

PATENT-3 866 075 Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Vacuum Type Trigger Discharge Tube with Cup Shaped Anode.
Patent,
John T. Grissom, and Leslie A. Shope. Filed 9 May 74, patented 11 Feb 75, 7p PAT-APPL-468 316
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Gas discharge tubes, *Patents, Switching, Life(Durability), Service life.
Identifiers: PAT-CL-313-178.

The patent describes a long-life discharge tube, which may be miniaturized and still hold-off high voltages. It may be operated in conditions which may include high pressure gas atmospheres and high temperatures surrounding the tube, including gas impervious ceramic and metal wall components over all exterior portions of the tube and a generally cup-shape anode electrode separated from an annular triggered cathode which is positioned at least partially within the walls of the anode.

PATENT-3 889 155 Not available NTIS
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Apparatus for Calibrating an Image Dissector Tube.
Patent.
E. E. Klingman, Iii. Patented 10 Jun 75, 8p PAT-APPL-448 325
Misc-Filed 5 Mar. 1974 Supersedes N74-18100 (12 - 09, p 1050).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Image dissector tubes, *Photosensitivity, Light transmission, *Patents, Signal processing.

Identifiers: PAT-CL-315-369.

An apparatus for calibrating digitally controlled image dissector tubes is described. The photosensitive screen of the tube is illuminated with a light pattern having parallel opposite edges. Then, a sweep signal is applied to the deflection coils causing the pattern to be scanned in a line perpendicular to the edges and generation of an output video pulse. The sweep signal is in the form of a time variable current whose average rate of change during the scan of the line is a constant and dependent on a settable control circuit. Measurement of the output pulse width permits the setting of the slope control circuit to be changed if the width differs from a standard associated with the tube whereby the scan rate is kept constant despite changes in the deflection sensitivity of the tube.

SAND-75-5251 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Cmos Latch-Up Analysis and Prevention.
B. D. Shafer. 1973, 17p CONF-750703-2

Descriptors: (*Transistors, *Physical radiation effects), (*Integrated circuits, Physical radiation effects), Carrier lifetime, Electric currents, Gain, Semiconductor rectifiers, Transients.

For abstract, see NSA 32 03, number 06573.

SAND-75-5288 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Unified Model of Damage Annealing in Cmos, from Freeze-in to Transient Annealing.
H. H. Sander, and B. L. Gregory. 4p CONF-750703-9

Descriptors: (*Mos transistors, *Annealing), Electrons, Gamma radiation, Holes, Low temperature, Neutron beams, Physical radiation effects, Pile neutrons, Recombination.

For abstract, see NSA 32 03, number 06960.

TID-26771 PC$4.00/MF$2.25
Hawaii Univ., Honolulu Dept. of Physics and Astronomy.
Electroluminescence in al--Al sub 2 O sub 3 -- Au Diodes.
W. Pong, C. Inouye, F. Matsunaga, and M. Moriwaki. 1972, 10p

Descriptors: (*Light emitting diodes, *Emission spectra), Aluminium, Aluminium oxides, Electroluminescence, Gold.

For abstract, see NSA 32 03, number 08434.

9B. Computers

AD-A013 578/0GA PC$3.75/MF$2.25
Illinois Univ At Urbana-Champaign Coordinated Science Lab
Natural Language Access to a Large Data Base.
Annual progress rept. 1 May 74-30 Apr 75,
David L. Waltz. Apr 75, 34p
Contract N00014-67-A-0305-0026

Descriptors: *Data bases, *Natural language, *Information systems, Naval aircraft, Maintenance, Information retrieval, Interfaces, Statistical analysis.

The report describes the first year's accomplishments toward a natural language system which answers questions about a data base of naval aircraft maintenance and flight data. The system is designed to: Allow a user to ask questions in natural English; provide answers to questions requiring averaging, statistical analysis, comparison of set of data, and other complex functions as well as answers to simpler questions about specific data base records; provide aid in evaluating and predicting the causes of failures and of the need for excessive amount of maintenance work.

AD-A013 610/1GA PC$4.75/MF$2.25
Optimum Computer Systems Inc New York
An Evaluation of a Cryptanalytic Technique for the Retrieval of Engineering Data.
Final rept. Jun 74-Mar 75,
J. S. Nadan, Homi Cooper, and Stan S. Shoneman. Mar 75, 85p Rept no. 700
Contract DAAA21-74-C-0542

Descriptors: *Information retrieval, *Computer programs, *Machine coding, Cryptography, Machine translation, Questionnaires, Data bases, Logistics support, Coding, Electronic equipment, Flow charting, Test methods, Debugging(Computers), Catalogs, English language.
Identifiers: Synonyms.

A program for the evaluation of selected cryptanalytic techniques for the retrieval of engineering data was conceived, designed and made ready for implementation. Utilization of cryptanalytic techniques allow the engineer to access a highly structured, fixed format data base via a free format English-language input query. Due to limited funds this test was not completed during this contract. (Author)

AD-A013 615/0GA PC$3.25/MF$2.25
Southeastern Massachusetts Univ North Dartmouth Dept of Electrical Engineering
Statistical Pattern Recognition Review and Outlook.
Interim technical rept.,
C. H. Chen. 25 Jun 75, 16p Rept no. EE-75-4
AFOSR-TR-75-1148
Grant AF-AFOSR-2119-71

Descriptors: *Pattern recognition, *Statistical analysis, Sampling, Syntax, Computations.
Identifiers: Feature extraction, Computational complexity, Feature selection.

In spite of the vigorous efforts by researchers, statistical pattern recognition remains to be a field which is rich in challenging theoretical problems. In this paper, emphasis is placed on near future and future outlook of this field while examining the recent development of the field. Ten problem areas where the solutions are most wanted are listed as: feature extraction, nonstationary patterns, adaptive systems, learning complexity, finite sample size effects, computational recognition complexity, contextual analysis, optimum pattern recognizer, statistical and syntactic mixed model, and the automatic generation of recognition rules for complex patterns. These problem areas are closely examined and possible future approaches are suggested. It is pointed out that any 'breakthrough' in solving these problems would probably require fertilization from other fields such as artificial intelligence, digital signal processing, etc.

AD-A013 624/2GA PC$5.25/MF$2.25
Naval Postgraduate School Monterey Calif
A Microprocessor-Based Communications Information System,
Robert Harry Ekstrom, and William Henry Reinhardt, III. Jun 75, 109p

Descriptors: *Weather communications, *Microcomputers, *Information systems, *Naval operations, Weather forecasting, Communications networks, Cathode ray tube screens, Interfaces, Computer programs, Theses.
Identifiers: *Microprocessors, File structures, PL/M programming language.

A functional design of a microprocessor-based system is proposed as a model for the Naval Enivronmental Display Station for use by the Naval Weather Service Environmental Detachments. The design consists of four modules: control, communications, storage, and display. A software program prototype that simulates many of the proposed functions of the control module is discussed. The processing requirements for the communications module are presented along with a proposed hardware configuration. The storage module, based on a floppy disk system, is explained and its required functions defined. A display module using an intelligent terminal and two CRTs is considered. The microprocessing system was designed to show not only the power and flexibility of this system, but also to demonstrate a potential application of low cost microprocessor technology.

AD-A013 628/3GA PC$4.25/MF$2.25
Naval Postgraduate School Monterey Calif
Generalized Approach for Evaluating Data Base Organization and Indexing Methods.
Master's thesis,
Rodolfo Mendiola Clautero. Jun 75, 53p

Descriptors: *Data bases, *Data storage systems, Organization theory, Indexing, Data management, Theses.
Identifiers: Data structures, File maintenance.

This paper is a study of data base organization and indexing methods with emphasis on the evaluation process. The approach of the study is focused on the data structure, a major characteristic of data base. Other aspects of the subject, indexing, for example, were discussed in relation to data structure. It was found that completeness and lucidity of knowledge of data base organization and indexing methods is necessary if one is to do a good job of evaluating a data base system.

AD-A013 629/1GA PC$5.75/MF$2.25
Naval Postgraduate School Monterey Calif
Software Error Detection Model.
Master's thesis,
Thomas Frederick Green. Jun 75, 135p

Descriptors: *Computer programming, Cost analysis, Errors, Detection, Computer programs, Reliability, Computerized simulation, Theses, FORTRAN.
Identifiers: *Computer program reliability.

A model of the error detection process for the testing of software has been developed to investigate the relationship between computer program structure and error detection and test effort. The model has been implemented as a simulation.

AD-A013 655/6GA Not available NTIS
Washington Univ Seattle Dept of Psychology
Artificial Intelligence,
Earl B. Hunt. 1975, 479p Rept no. ISBN-0-12-362340-5 AFOSR-TR-75-1184
Grant AF-AFOSR-1944-70
Library of Congress Catalog Card no. 74-1626.
Availability: Paper copy available from Academic Press, Inc., 111 Fifth Ave., New York, N.Y. PC$29.00. (Academic Press Series in Cognition and Perception).

Descriptors: *Artificial intelligence, *Pattern recognition, *Textbooks, Problem solving, Natural language, Self organizing systems, Robots, Computer programming, Statistical analysis, Mathematical logic, Game theory.
Identifiers: Turing machines, Feature extraction.

Contents:
The scope of artificial intelligence;
Programming program structure, and computability;
General considerations in pattern recognition;

Pattern classification and recognition methods based on euclidean description spaces;
Non-euclidean parallel procedures the perceptron;
Sequential pattern recognition;
Grammatical pattern classification;
Feature extraction;
Computer manipulable representations in problem solving;
Graphic representations in problem solving, Heuristic problem-solving programs;
Theorem proving;
Computer perception;
Question answering;
Comprehension of Natural language, Review and prospectus.

AD-A013 656/4GA PC$6.25/MF$2.25
University of Southern California Marina Del Rey Information Sciences Inst
Protocol Analysis of Man-Computer Languages: Design and Preliminary Findings. Appendix Supplement.
Jul 75, 175p Rept no. ISI/RR-75-34
Contract DAHC15-72-C-0308
See also AD-A013 568.

Descriptors: *On line systems, *Message processing, Language, Man machine systems.
Identifiers: *Man machine communications, Protocols.

The report contains appendices of simulator, consultant, and observer commands for logon-logoff messages for on line systems.

AD-A013 661/4GA PC$5.25/MF$2.25
Naval Postgraduate School Monterey Calif
Computer-Aided Design of Recursive Digital Notch-Filter with One Coefficient.
Master's thesis,
Tran Truc Viet. Jun 75, 124p

Descriptors: *Computer aided design, *Digital filters, *Charge coupled devices, *Recursive filters, Errors, Gain, Optimization, Transfer functions, Theses, Attenuation.
Identifiers: Notch filters, IBM 360/70 computers.

A procedure for the design of a recursive digital notch-filter with one coefficient is proposed. This type of filter can be implemented readily with CCD (charge-coupled device). The effect of coefficient on notch-gain, notch-width, and passband-ripple is examined. The computer implementation is tested for second, third, and sixth order notch-filters and the optimum coefficient is found based upon limited computer wordlength. (Author)

AD-A013 679/6GA PC$4.75/MF$2.25
Illinois Univ At Urbana-Champaign Dept of Computer Science
Architectural Considerations in the Design of Special-Purpose Machines,
Leslie Norbert Daley. May 75, 94p Rept no. UIUCDCS-R-75-733
Contract N00014-67-A-0305-0007

Descriptors: *Computer architecture, *Microprogramming, State of the art, Costs, Reliability(Electronics), Memory devices, Debugging(Computers), High reliability, Parallel processing, Multiplexing, Theses, Keyboards.
Identifiers: *Special purpose computers, Design.

In the first part of this thesis, the architectural development of a specific machine is presented. The experiences gained during this design project indicate that there is a 'best' system architecture for a given problem. Design options become available only on lower design levels, mainly in control units. The second part of the paper analyzes the choice between microprogrammed and hardwired realizations of control units. A model which predicts the costs of equivalent microprogrammed and hardwired control units is developed. This model predicts that the cost of a hardwired control unit will increase faster than that of its microprogrammed counterpart as the control signals which must be emitted become more complex. From the same foundations, a model for the reliability of both methods can be obtained. This model predicts that the reliability of a microprogrammed control is nearly independent of the control sequence. Hardwired control units, however, suffer from decreased reliability as control complexity grows. (Author)

AD-A013 737/2GA PC$4.25/MF$2.25
Aerospace Corp El Segundo Calif Technology Div
The Aids Inventory Project.
Interim rept.,
D. J. Reifer. 16 Jul 75, 70p Rept no. TR-0075(5112)-8 SAMSO-TR-75-184
Contract F04701-74-C-0075

Descriptors: *Computer programs, *Inventory analysis, Compilers, Monitors, Simulators, Test methods, Libraries.
Identifiers: Computer program verification.

This document reports the progress made in an effort directed towards establishing an aids inventory. The aids inventory will serve as a center for storage and distribution of support programs (i.e., simulators, analyzers, etc.) used for development, test, and maintenance of operational software at SAMSO. Preliminary conclusions based on the limited data collected for the 131 aids listed in the report are presented.

AD-A013 806/5GA PC$5.25/MF$2.25
Texas Univ At Austin Electronics Research Center
Transient Probability Models of Computing System Dynamic Behavior.
Technical rept.,
Wilfred S. Litzler, and Baxter F. Womack. 1 May 75, 124p Rept no. TR-170 AFOSR-TR-75-1127
Contract F44620-71-C-0091

Descriptors: *Computer applications, *Computations, Markov processes, Data processing, Statistical analysis, Numerical analysis, Queueing theory, Network flows, Computer programs, FORTRAN.
Identifiers: CDC 6600 computers, SemiMarkov processes.

The analysis of computing systems using mathematical models is most often concerned with the determination of long-term statistical trends or the prediction of steady-state probabilistic behaviour. Valuable insight into the dynamic operation of computing systems, however, is not always directly obtainable by such approaches. For this purpose, the application of certain transient probability models may be beneficial in some instances. A two-part investigation of transient probability models of computing systems is described. In the first investigation, the dynamic operation of a single peripheral processor as it performs an assigned task in a CDC 6600 computing system is studied. The transient analysis of queuing networks frequently used to model computing systems was studied in the second investigation. A probability flow technique for numerically analyzing networks of single queues is described. Models formulated by the method presented provide an enhanced level of detail not available in conventional queuing models. Three case studies are included to demonstrate the capabilities of this modeling technique.

AD-A013 822/2GA PC$3.75/MF$2.25
Defense Communications Engineering Center Reston Va
Concept for DCEC Data Base.
Technical note,
E. Pierce O'Grady, and James D. Gregg. Oct 73, 41p Rept no. TN-45-73

Descriptors: *Data bases, *Hybrid simulation, *Communication and radio systems, Centralized, Data management, Engineering, Management information systems, Computer programs, Files(Records), Digital computers, Information retrieval, Electronics laboratories, Information processing.
Identifiers: Defense Communications Engineering Center, IBM 370/155 computers.

Creation of the DCS Hybrid Simulation Facility and acquisition of its IBM System 370/155 provide the opportunity to establish a unified data base to support DCEC studies and DCS system design applications. This report describes factors considered in developing a plan to integrate existing and planned engineering data files into a common data base and to implement a data base management system to manipulate this data base. (Author)

AD-A013 823/0GA PC$3.75/MF$2.25
Defense Communications Engineering Center Reston Va
DAIS Data Interrogation System.
Technical note,
P. M. Cohen. Jan 74, 48p Rept no. TN-1-74

Descriptors: *Files(Records), *Data processing, *Information retrieval, Systems engineering, Interrogation, Computer programming, Computer programs, Digital computers, Batch processing, Information processing, Communication and radio systems, Electronics laboratories.
Identifiers: Higher order languages, IBM 370 computers, Virtual processing, DAIS(Data interrogation system), Data interrogation system, Defense Communications Engineering Center.

This report describes a file data retrieval concept (DAIS) geared to the system engineer. The program is designed for TSO or batch processing on an IBM 370. Its unique feature is that it operates on a file subset that fits into computer memory; processing is in a virtual manner. This allows quick-response, interactive use of the system using standard TSO procedures. (Author)

AD-A013 824/8GA PC$3.75/MF$2.25
Defense Communications Engineering Center Reston Va
Functional Description (FD) of the DCEC Data Base Development and Implementation (Phase 1).
Technical note,
W. Wolfe, and R. Forney. May 74, 31p Rept no. TN-15-74

Descriptors: *Data bases, *Communication and radio systems, Hybrid simulation, Functional analysis, Centralized, Data management, Engineering, Management information systems, Computer programs, Files(Records), Digital computers, Information retrieval, Electronics laboratories, Information processing.
Identifiers: Defense Communications Engineering Center.

This report provides a functional description (FD) of the DCEC Data Base which is being developed for use in engineering design and analysis applications. The report specifically covers Phase I of the Data Base development which comprises implementation of 21 separate files. (Author)

AD-A013 825/5GA PC$3.75/MF$2.25
Defense Communications Engineering Center Reston Va
DCEC Data Base (Phase II).
Technical note,
W. Wolfe, and R. Forney. Oct 74, 46p Rept no. TN-25-74

Descriptors: *Data bases, *Communication and radio systems, Dictionaries, Hybrid simulation, Centralized, Data management, Engineering, Management information systems, Computer programs, Files(Records), Digital computers, Information retrieval, Electronics laboratories, Information processing.
Identifiers: Defense Communications Engineering Center.

This technical note provides a Functional Description (FD) of the DCEC Data Base (Phase II) development effort. It describes accomplishments of the Data Base effort during Phase I describes the organizational and development concepts for Phase II, serves as a basis for mutual understanding between users of the Data Base (DB) and the developing function (Code R920), outlines the project development plan for Phase II, describes each major section of the Data Base, and describes the Data Base Dictionary (DBD) which facilitates understanding and ease of use for all DB users. (Author)

AD-A013 829/7GA PC$3.75/MF$2.25
Army Computer Systems Command Fort Belvoir Va
An Algorithm for Blocking Factor Optimization.
Final rept.,
Larry A. Pickard, and Marvin D. Raines. 1 Jul 75, 40p Rept no. USACSC-AT-75-03

Descriptors: *Files(Records), *Magnetic tape, *Magnetic disks, *Blocking, Algorithms, Optimization, Mathematical prediction, Central processing units, Digital computers, Serial processors, Sequential.
Identifiers: IBM 360 computers, *Blocking factors, Performance monitoring, *Sequential files, *Computer performance evaluation.

This report describes a performance enhancement study carried out to examine the impact of blocking factors on program run time in a fixed partition environment. Initial analysis is described to determine blocking factor behavior. The results of this analysis forms the basis for the development of a performance enhancement utility routine to automatically predict the best blocking assignment for tape and sequential disk files to minimize program run time. The derivation of the appropriate mathematical optimization algorithm and the underlying assumptions inherent in the algorithm are explained. Summary results and typical time savings from the use of the algorithm are provided to indicate the increase in resource utilization that can be realized from implementing the routine. Detailed procedures on how to use this tool are also provided. (Author)

AD-A013 830/5GA PC$3.75/MF$2.25
North Carolina State Univ Raleigh Dept of Computer Science
The MPP Simulator - User's Manual.
Rept. for Apr-Dec 74,
Yale N. Patt, William L. Albert, A. Mark Edwards, Alan L. Stewart, and Glenn L. Williamson. Jun 75, 46p FA-FCF-2-76
Contract DAAA25-74-C-0502

Descriptors: *Simulators, *Processing equipment, *Microprogramming, Digital computers, Manuals, Fortran, Tracer studies, Warning systems, Batch processing.
Identifiers: MPP(Microprogrammable processor), Microprogrammable processor, CDC 5600 computers, IBM 360 computers, Firmware, Error messages, Interactive systems.

This report represents the User's Manual for the CDC 5600 Micro-Programmable Processor Simulator. The host computers are the CDC 6000 series and the IBM 360 series. The simulator is written in Fortran for the CDC computer and in BAL for the 360 computer. The manual describes the simulator commands and options and a sample print out of the simulator being used is shown in Appendix II. (Author)

AD-A013 856/0GA PC$3.75/MF$2.25
California Univ Los Angeles Dept of Computer Science
Recent Computer Science Research in Language Processing.
Interim rept.,
Allen Klinger. Jun 75, 30p Rept no. UCLA-ENG-7541 AFOSR-TR-75-1153
Grant AF-AFOSR-2384-72

Descriptors: *Computer applications, *Artificial intelligence, *Natural language, Semantics, Syntax, Speech recognition, Information retrieval, Information processing.

The machine translation problem has recently been replaced by much narrower goals and computer processing of language has become part of artificial intelligence (AI), speech recognition, and structural pattern recognition. These are each specialized Computer Science research fields with distinct objectives and assumptions. The narrower goals involve making it possible for a computer user to employ a near natural-language mode for problem-solving, information retrieval, and other applications. Natural computer responses have also been created and a special term, 'understanding' has been used to describe the resulting computer/human dialogues. The purpose of this paper is to survey these recent developments to make the AI literature accessible to researchers mainly interested in computation on written text or spoken language.

AD-A013 870/1GA PC$4.75/MF$2.25
Army Computer Systems Command Fort Belvoir Va
Combat Service Support System Timing Study.
Final rept.,
William D. Kerns. 1975, 92p Rept no. USACSC-ATS-75-01

Descriptors: *Digital computers, *Systems engineering, *Computer programs, *Regression analysis, *Data processing, Control sequences, Time, Computerized simulation, Performance(Engineering), Input output processing, Systems engineering, Logistics support, Army personnel, Maintenance, Methodology, Life cycles, Mathematical prediction, Computer aided design, Estimates.
Identifiers: *Computer runtimes, *Linear regression analysis, Workloads, CASE(Computer aided systems evaluation), Computer aided systems evaluation, IBM 360/30 computers, *Computer performance evaluation.

This report describes a study conducted to forecast the number of hours required to process the personnel, logistics, and maintenance software systems for a division using the Combat Service Support System (CS sub 3) IBM 360/30 hardware configuration under average to maximum workloads. These systems and their component subsystems range in state of development from the conceptual to operational, requiring use of separate forecasting methodologies based on the life cycle of the software. For the personnel system, linear regression techniques were used to predict runtimes based on expected volumes of input and output. A simulation model was constructed using the Computer Aided Systems Evaluation (CASE) package to predict runtimes for the logistics system. Runtimes for the maintenance system were predicted by CASE simulation and by analyst estimates. The conclusion of this study is that the CS sub 3 hardware system will be adequate under average workloads but may become saturated under maximum workloads. Several proposals which should lower the computer time requirements below the saturation levels are discussed.

AD-A013 914/7GA PC$3.75/MF$2.25
Air Force Materials Lab Wright-Patterson AFB Ohio
Data Acquisition and Analysis of Long-Term Thermo-Aging Degradation Data.
Technical rept. Feb-Jun 74,
Dennis Wisnosky, Perry Cockerham, and John Crist. May 75, 29p Rept no. AFML-TR-74-257

Descriptors: *Computer applications, *Data acquisition, Laboratory tests, Interfaces, Aging(Materials), Degradation, Computer programming, FORTRAN.

Computer support for laboratory experimentation is becoming increasingly important in all types of scientific research. The more complex an experiment becomes, the greater the need for computer calculation, control, and data acquisition. This report describes a particular data acquisition instrument control applications to an experiment in 'Thermo-aging'. Emphasis has been placed on installation and operation to aid in future applications of the data acquisition system.

AD-A013 950/1GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Minimum Directivity of Multiple-Beam Antennas.
Journal article,
Andre R. Dion. 24 Jun 74, 3p Rept no. JA-4412 ESD-TR-75-197
Contract F19628-73-C-0002
Availability: Pub. in IEEE Transactions on Antennas and Propagation, vAP-23 n2 p283-284 Mar 75.

Descriptors: *Antennas, *Space communications, *Antenna feeds, Directional, Focusing, Gain, Computer programs, Reprints.
Identifiers: Multiple beam antennas, Spacing.

The minimum directivity of a multiple-beam antenna is an important design parameter of the related communications system. This parameter is a function of the spacing between the feeds of a focusing device. In this communication it is shown that the minimum directivity can be optimized by the proper choice of feed spacing. (Author)

COM-75-11072/8GA PC$3.25/MF$2.25
National Bureau of Standards, Washington, D.C. Systems and Software Div.
Proposed Implementation for Development of User-Terminal Protocols for Computer Network Access.
Final rept.,
Albrecht J. Neumann. Jul 75, 17p NBSIR-75-744
Grant NSF-CA-68

Descriptors: *Data processing terminals, Standards.
Identifiers: *Federal information processing standards, *Computer networks, Command languages(Computers), Protocols.

This report summarizes activities undertaken at the National Bureau of Standards in the area of User-Terminal Protocol Standardization with support from the National Science Foundation, during the latter part of 1974 and 1975. Also discussed are present status of related standardization activities in areas of command languages, terminal keyboards, and terminology. Legal implications of standardization are indicated, and establishment of a Federal Task

Group for Standardization is proposed to work under the Federal Information Processing Standards Coordinating and Advisory Committee (FIPSCAC).

COM-75-11113/8GA PC$3.75/MF$2.25
National Bureau of Standards, Washington, D.C. Systems and Software Div.
Exploring Privacy and Data Security Costs - A Summary of a Workshop,
John L. Berg. Aug 75, 38p NBS-TN-876
Library of Congress Catalog Card no. 75-600063.

Descriptors: *Data processing terminals, *Meetings, Costs.
Identifiers: *Data processing security, *Computer privacy, *Computer information security.

On February 20, 1975, nine informed EDP professionals were invited by the Systems and Software Division of the Institute for Computer Sciences and Technology to discuss the costs Federal agencies should anticipate in complying with the Privacy Act of 1974. The invitees came from Federal agencies, private industry, and academe and shared an interest in the three questions posed by the day's agenda: (1) What benefits or increased value will EDP managers or data base administrators gain from implementing privacy requirements; (2) What direct or hidden costs can be identified and what processes can be used to identify costs; (3) How should costs be allocated among those who receive privacy's benefits or face its obligations.

NTIS/PS-75/657/7GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Trends in Computer Technology (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
David W. Grooms. Aug 75, 48p*

Descriptors: *Bibliographies, *Computer systems hardware, *Computer programming, *Trends, Forecasting, Economic development, Data processing, Logic devices, Time sharing, Minicomputers, Parallel processors.
Identifiers: Computer applications, Computer networks.

Past, present, and future trends in computer hardware development and computer software generation are reviewed. The bibliography also presents prospects, problems, and pitfalls in the development of computer technology, as well as studies of trends in the Soviet Union. (Contains 43 abstracts)

NTIS/PS-75/686/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Magnetic Bubble Domains (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
George W. Reimherr. Sep 75, 60p*
Supersedes NTIS/PS-75/086.

Descriptors: *Thin film storage, *Bibliographies, *Computer storage devices, *Magnetic domains, Random access computer storage, Logic design, Crystal growth, Radiation effects, Magnetic materials, Domain walls, Abstracts.
Identifiers: *Magnetic bubble domains, Magnetic film memories.

The citations discuss material properties, crystal growth, domain structure and motion, nuclear radiation effects, and applications as magnetic memory devices. (Contains 55 abstracts)

N75-25988/7GA PC$3.75/MF$2.25
Tennessee Univ., Knoxville. Computing Center.
Study of Data Entry Requirements at Marshall Space Flight Computation Center.
Final Report.
G. R. Sherman. 30 May 75, 47p NASA-CR-143882
Contract NAS8-30879

Descriptors: *Computer programming, *Data systems, *Document storage, *Economic analysis, *Research facilities, *Systems analysis, Cost analysis, Data management, Documentation, Hardware, Personnel development, Punched cards.

For abstract, STAR 1317

N75-26470/5GA PC$8.50/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
Trade-off Analysis of Modes of Data Handling for Earth Resources (Ers), Volume 1.
Final Report.
28 Mar 75, 266p NASA-CR-143804, TRW-22591-6001-RU-00-VOL
Contract NAS5-21927

Descriptors: *Data management, *Data systems, *Earth resources program, *Satellite observation, Communication theory, Data links, Data processing, Mission planning, Selective dissemination of information.

For abstract, STAR 1317

N75-26471/3GA PC$8.75/MF$2.25
TRW Systems Group, Redondo Beach, Calif.
Trade-off Analysis of Modes of Data Handling for Earth Resources (Ers), Volume 2.
Final Report.
28 Mar 75, 286p NASA-CR-143806, TRW-22591-6001-RU-00-VOL
Contract NAS5-21927

Descriptors: *Data management, *Data systems, *Earth resources program, *Satellite observation, Communication theory, Data links, Data processing, Mission planning, Selective dissemination of information.

For abstract, STAR 1317

N75-26473/9GA PC$5.25/MF$2.25
Environmental Research Inst. of Michigan, Ann Arbor. Infrared and Optics Div.
Estimating Proportions of Objects from Multispectral Scanner Data.
Final Technical Report, 15 May 1974 - 14 Mar. 1975.
H. M. Horwitz, J. T. Lewis, and A. P. Pentland. May 75, 117p NASA-CR-141862, ERIM-109600-13-F
Contract NAS9-14123

Descriptors: *Data processing, *Multispectral band scanners, Algorithms, Signature analysis.

For abstract, STAR 1317

N75-26477/0GA PC$4.25/MF$2.25
Purdue Univ., Lafayette, Ind. Lab. for Applications of Remote Sensing.
An Introduction to Quantitative Remote Sensing.
J. Lindenlaub, and J. Russell. 1974, 63p NASA-CR-141860, LARS-NOTE-110474
Contract NAS9-14016

Descriptors: *Data processing, *Remote sensors, Computer systems programs, Pattern recognition, Technology utilization.

For abstract, STAR 1317

N75-26673/4GA PC$5.25/MF$2.25
Technische Universitaet, Munich (West Germany).
The Automatic Patchboard: Construction, Graphic Theoretical Description, Practical Application das Automatic Patchboard: Struktureller Aufbau, Graphentheoretische Beschreibung, Parktische Realisierung.
Ph.D. Thesis.
D. Wiesenbart. 19 Jun 74, 117p
Language in German.

Descriptors: *Control units (Computers), *Hybrid computers, *Sequential control, *Switching circuits, Algorithms, Analog simulation, Computer programming, Networks, Structural analysis.

For abstract, STAR 1317

N75-26674/2GA PC$4.75/MF$2.25
Forschungsinstitut fuer Anthropotechnik, Meckenheim (West Germany).
Dynamical Tridimensional Information Display on Screens Dynamische 3D-Informationsdarstellung Auf Bildschirmen.
K. F. Kraiss. Jun 74, 81p FB-17
In German; English Summary.

Descriptors: *Cathode ray tubes, *Computer graphics, *Display devices, *Dynamic models, Color, Computer components, Computer programs, Flight simulation, Pdp computers, Performance prediction, Runways.

For abstract, STAR 1317

N75-26695/7GA PC$6.25/MF$2.25
Technische Universitaet, Munich (West Germany).
Reliable Decoding: A New Decoding Procedure for Product Codes Zuverlaessigkeitsdecodierung: Ein Newes Decodierverfahren fuer Produktcodes.
Ph.D. Thesis.
E. Vancek. 21 Feb 74, 170p
Language in German.

Descriptors: *Computer programming, *Decoding, *Error correcting codes, *Steps, Binary codes, Error analysis, Iterative solution, Reliability.

For abstract, STAR 1317

N75-26696/5GA PC$4.25/MF$2.25
Forschungsinstitut fuer Funk und Mathematik, Werthoven (West Germany).
Report on the Research Project 'Models for an Intermachine Compiler' Bericht ueber das Forschungsvorhaben "Modelle fuer Einen Intermaschinellen Compiler".
L. Schuberth. Apr 74, 71p REPT-220
In German; English Summary.

Descriptors: *Compilers, *Digital computers, *Research, Models, Programming languages, Translating.

For abstract, STAR 1317

N75-26697/3GA PC$3.75/MF$2.25
Forschungsinstitut fuer Funk und Mathematik, Werthoven (West Germany).
Investigation on Index-Sequential Search Methods Untersuchung Index-Sequentieller Suchmethoden.
L. Eberhard. May 74, 39p REPT-221
In German; English Summary.

Descriptors: *Computer programming, *Indexes (Documentation), *Information retrieval, *Searching, Access time, File maintenance (Computers), Rectangles, Triangles.

For abstract, STAR 1317

N75-26720/3GA PC$6.25/MF$2.25
Gesellschaft fuer Mathematik und Datenverarbeitung, Bonn (West Germany). Abteilung fuer Behoerdliche DV-Systeme.
Structure and Efficiency of Data Bank Systems: Collection and Analysis of User Requirements Struktur und Leistungsumfang von Datenbanksystemen. Sammlung und Analyse von Benutzervorstellungen.
K. Supper. Mar 74, 157p
Language in German.

Descriptors: *Computer systems design, *Data bases, *Management information systems, *User requirements, Data storage, Information retrieval, Surveys.

For abstract, STAR 1317

N75-26739/3GA PC$4.25/MF$2.25
Texas A&M Univ., College Station. Dept. of Mathematics.
Lfspmc: Linear Feature Selection Program Using the Probability of Misclassification.
L. F. Guseman, Jr., and B. P. Marion. Jan 75, 52p NASA-CR-141878, REPT-3
Contract NAS9-13894

Descriptors: *Computer programs, *Linear prediction, *Multivariate statistical analysis, *Probability density functions, Algorithms, Classifications, Numerical analysis, Vector analysis.

For abstract, STAR 1317

N75-26740/1GA PC$3.25/MF$2.25
Houston Univ., Tex. Dept. of Mathematics.
Maximum Likelihood Signature Estimation.
H. F. Walker. Apr 75, 10p NASA-CR-141882, REPT-42
Contract NAS9-12777

Descriptors: *Maximum likelihood estimates, *Normal density functions, *Signature analysis, Fixed points (Mathematics), Iterative solution, Pattern recognition.

For abstract, STAR 1317

N75-26741/9GA PC$3.25/MF$2.25
Houston Univ., Tex. Dept. of Mathematics.
A Counter Example In Linear Feature Selection Theory.
D. R. Brown, and M. J. Omalley. Mar 75, 7p NASA-CR-141881, REPT-41
Contract NAS9-12777

Descriptors: *Linear systems, *Matrices (Mathematics), *Pattern recognition, Divergence, Euclidean geometry, Problem solving.

For abstract, STAR 1317

N75-26743/5GA PC$3.25/MF$2.25
Houston Univ., Tex. Dept. of Mathematics.
On the Variational Equations for Householder Transformations in Feature Selection.
H. P. Decell, Jr., and M. Mayekar. Mar 75, 8p NASA-CR-141880, REPT-39
Contract NAS9-12777

Descriptors: *Multivariate statistical analysis, *Transformations (Mathematics), Linear equations, Matrices (Mathematics), Sequential analysis.

For abstract, STAR 1317

PB-243 217/7GA PC$3.75/MF$2.25
CACI, Inc., Los Angeles, Calif. Systems Programming Dept.
A Quick Look at SIMSCRIPT II.5.
Final rept. 4th ed. Jul 73,
E. C. Russell, and J. S. Annino. Jul 75, 30p
CACI-SI-75/01

Descriptors: *SIMSCRIPT programming language, *Computerized simulation, Programming manuals, Operating systems(Computers), Inventory control, Queueing theory, Simulation languages.
Identifiers: *SIMSCRIPT 2.5 programming language, Computer applications, Job shops.

The Air Force, Navy, and Army have each sponsored implementations of the SIMSCRIPT II.5 simulation language. The II.5 modeling concepts are described and demonstrated in this document, through the use of three complete applications as follows: Inventory Control, Queuing, and Job Shop. Each of the models is developed from a general problem description. Sample data and corresponding output is included.

PB-243 785/3GA PC$3.25/MF$2.25
Research Inst. of National Defense, Stockholm (Sweden).
Putting Statistics Into a Simula Program,
Jacob Palme. Jul 75, 12p FOA-1-C10030-M3(E5)

Descriptors: *Computer programming, *Computerized simulation, Programming languages, Statistical analysis, Sweden.
Identifiers: Structured programming, SIMULA programming language.

Statements for outputting a trace of what happens during a simulation, and for collecting statistics to be output after the end of the simulation, should not clutter up the main logic of the simulation program. This paper shows with a simple example how a SIMULA program can be structured such that the tracing and statistics and the main logic of the simulation program are partitioned into different segments of the program. The paper will, at the same time, show the general facilities which SIMULA has for this kind of program structuring.

UCRL-51742 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Reduced, a Data Reduction Code.
N. Maron. 22 Jan 75, 32p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *R codes), Cdc computers, Data acquisition systems, Data processing, Display devices, Fortran, Least square fit.

For abstract, see NSA 32 03, number 06585.

9C. Electrical and Electronic Engineering

AD-A013 618/4GA PC$10.00/MF$2.25
Georgia Inst of Tech Atlanta Engineering Experiment Station
FAA/Georgia Institute of Technology Grounding Workshop and Lightning Protection Seminar.
Final rept.
May 75, 353p FAA-RD-75-106
Contract DOT-FA72WA-2850
See also report dated Mar 74, AD-785 858.

Descriptors: *Electrical grounding, *Meetings, *Lightning arresters, Electronic equipment, Lightning, Protection, Electromagnetic shielding, Suppressors, Electromagnetic interference, Electromagnetic compatibility, Transients, Transient radiation effects, Electric cables.
Identifiers: DOT/4IZ/IY.

A state-of-the-art review and background research reveals and a significant divergence of opinion as to the prefered techniques of grounding of electronic equipments and systems. There exists an absence of agreement on a unified approach to grounding which is applicable to all frequency ranges and signal types. The System Research and Development Service of the Federal Aviation Administration in conjunction with the Georgia Institute of Technilogy conducted a workshop which brought together distinguished experts in the field of grounding as related to EMI/EMC and lightning. This report contains the papers presented at the workshop.

AD-A013 816/4GA PC$9.25/MF$2.25
Texas Univ At Austin Electronics Research Center
Texas Biannual of Electronics Research Number 21.
Summary rept. 1 Oct 74-31 Mar 75,
Arwin A. Dougal. 15 May 75, 316p AFOSR-TR-75-1147
Contract F44620-71-C-0091
See also Number 20, AD-A010 483.

Descriptors: *Electronics, Solid state electronics, Information systems, Plasmas(Physics), Quantum electronics, Biomedicine, Geomagnetism.

This Twenty-First Biannual includes recent finding, research investigations, progress reports and future plans in the areas of Solid State Electronics, Information Systems, Plasma and Quantum Electronics, Bio-Medical Electronics, and Acoustics and Radio Sciences.

AD-A013 934/5GA PC$4.25/MF$2.25
Air Force Avionics Lab Wright-Patterson AFB Ohio
An Introduction to Fault-Tolerant Design Techniques.
Technical rept.,
Thomas E. Tyson. Jun 75, 36p Rept no. AFAL-TR-74-334
Supplement to report dated Jun 74, AD-784 879.

Descriptors: *Avionics, *Reliability(Electronics), Redundant components, Computer architecture, Faults, Failure, Mathematical models.
Identifiers: *Fault tolerant computing.

This report introduces the concept of fault-tolerant architectures and surveys general techniques for the design of fault-tolerant systems. The techniques discussed are for digital systems or systems that can be visualized as being digital in nature.

AD-A014 018/6GA PC$3.25/MF$2.25
Polytechnic Inst of New York Brooklyn Dept of Electrical Engineering and Electrophysics

A New Class of Components Which do not Require Piezoelectric Substrates,
A. Oliner, and K. Yen. 1974, 8p AFOSR-TR-75-1144
Grant NSF-GK-33994
Availability: Pub. in Proceedings of the 1974 Ultrasonics Symposium, IEEE, n74 CHO 896-1SU p108-113 1974.

Descriptors: *Acoustic waves, Surface waves, Reflection, Substrates, Piezoelectric materials, Delay lines, Power dividers, Attenuation, Suppressors, Filters, Reprints.

A new class of components for acoustic surface waves has been developed which is based on simple structures and which may be used on any substrate, whether piezoelectric or not. The freedom with respect to the substrate allows a greater flexibility in the choice of materials, and permits optimization for special purposes, such as greater temperature stability, lower loss, etc. The components include power splitters, directional couplers, nonreflecting delay-line taps, attenuators, bulk-wave suppressors, beam redirectors, resonant cavities and certain types of filters. (Author)

AD-A014 029/3GA PC$3.25/MF$2.25
Hawaii Inst of Geophysics Honolulu
Deconvolution and Spectral Estimation Using Final Prediction Error,
Gerard J. Fryer, Mark E. Odegard, and George H. Sutton. 27 Mar 74, 16p Rept no. HIG-Contrib-663
Contract N00014-70-A-0016-0001
Availability: Pub. in Geophysics, v40 n3 p411-425 Jun 75.

Descriptors: *Signal processing, Algorithms, Mathematical prediction, Hydrogen, Ocean bottom, Seismometers, Spectrum analysis, Least squares method, Detection, Reprints.
Identifiers: Deconvolution, Microseisms.

Least-squares, zero-lag inverse filters may be used for predictive deconvolution of stationary time series and for obtaining autoregressive or maximum entropy spectral estimates. The greatest problem in finding such an inverse filter is determining the optimum operator length for a given finite length of data. The identical problem of determining the correct order of an autoregressive model for the data has been solved by Akaike, whose final prediction error (FPE) statistic is a minimum for the optimum length model. This minimum FPE criterion may be applied to both single and multiple time series.

N75-26259/2GA PC$3.25/MF$2.25
Materials Research Labs., Maribyrnong (Australia).
Lightning Warning Systems and the Protection of Transistorised Circuits for Firing Range Equipment.
K. K. M. Wu, and D. W. Williams. Feb 75, 18p MRL-TN-364

Descriptors: *Circuit protection, *Lightning, *Warning systems, Atmospheric electricity, Circuit breakers, Electric fields, Electric relays, Safety management, Thunderstorms.

For abstract, STAR 1317

N75-26494/5GA PC$3.75/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
Radiated Microwave Power Transmission System Efficiency Measurements.
R. M. Dickinson, and W. C. Brown. 15 May 75, 45p NASA-CR-142986, JPL-TM-33-727
Contract NAS7-100

Descriptors: *Electric power transmission, *Microwave equipment, *System effectiveness, Ac generators, Direct power generators, Electric equipment, Power efficiency.

For abstract, STAR 1317

PAT-APPL-582 318/GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Switchable Beamwidth Monopulse Method and System.
Patent Application.
L. F. Deerkoski, and R. F. Schmidt. Filed 30 May 75, 30p NASA-CASE-GSC-11924-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Beam switching, *Monopulse antennas, Disks (Shapes), *Patent applications, Reflectors, Signal transmission.

In a switchable beamwidth monopulse method and system, an antenna is described, comprising a curved reflector and a first set of monopulse feeds positioned in the Airy disk. The second set of monopulse feeds is positioned outside the Airy disk in the region of first bright Airy ring. In narrow beamwidth monopulse operation, monopulse sum and difference channel patterns are obtained from the first set of feeds within the Airy disk. In wide beamwidth monopulse operation, the difference channel pattern is obtained from the second set of feeds in the Airy ring. The sum channel pattern is obtained by attenuating and phase shifting the sum channel signal obtained from the first set of feeds, and adding the resultant to the sum channel signal obtained from the second set of feeds. The difference channel patterns for both narrow and wide beamwidth mode operation are obtained from the second set of feeds.

UCRL-76290 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Ingredients of Protection Engineering.
V. R. Latorre, and L. R. Spogen, Jr. 16 Dec 74, 7p CONF-750512-1

Descriptors: (*Electronic equipment, *Physical radiation effects), Electromagnetic pulses, Equipment protection devices.

For abstract, see NSA 32 03, number 06574.

9D. Information Theory

AD-A013 875/0GA PC$3.25/MF$2.25
Michigan Univ Ann Arbor Dept of Aerospace Engineering
Channel and System Modelling for Identification,
William L. Root. Aug 74, 17p AFOSR-TR-75-1102
Grant AF-AFOSR-2328-72

Descriptors: *Control theory, *Information theory, *Statistical analysis, Nonparametric statistics, Identification, Mathematical models, Linear systems, Nonlinear systems.

In these lectures a class of models for input-output systems, suitable for use in identification is discussed. These models are appropriate in particular when the prior information is in nonparametric form. The models can be used to represent a rather large variety of systems, nonlinear as well as linear, but they are somewhat restricted in their application because noise is allowed only in the observation of the system output. The greater part of the discussion is intuitive and nonrigorous, but a brief section is included giving reference to the supporting mathematical theory.

AD-A013 919/6GA PC$3.25/MF$2.25
Stanford Univ Calif Stanford Electronics Labs
Optimal Data Compression, Finite Memory, and Joint Source-Channel Encoding.
Interim scientific rept. 1 May 74-30 Apr 75,
Martin E. Hellman. 1975, 10p AFOSR-TR-75-1032
Contract F44620-73-C-0065

Descriptors: *Data compression, *Communications networks, Coding, White noise, Stochastic processes.
Identifiers: Convolutional codes.

The research progress under this contract falls into two primary areas: data compressive tree codes and multiuser communication networks.

AD-A013 939/4GA PC$5.75/MF$2.25
Georgia Inst of Tech Atlanta School of Electrical Engineering
Development of a Transmission Error Model and an Error Control Model,
Joseph L. Hammond, Jr., James E. Brown, and Shyan-Shiang S. Liu. May 75, 141p RADC-TR-75-138
Contract F30602-72-C-0409

Descriptors: *Pulse communications, *Data transmission systems, *Coding, Communications networks, Markov processes, Signal to noise ratio, Statistical analysis, Digital systems.
Identifiers: *Error detection codes, Binary codes, Block codes.

The objective of this study is to choose an error detecting code for use in general purpose digital communication networks which employ automatic repeat request. To choose a code it is necessary to characterize the channels used by the communication network.

9E. Subsystems

AD-A013 663/0GA PC$5.75/MF$2.25
Naval Postgraduate School Monterey Calif
An Analysis of a Digital Positioning System.
Master's thesis,
Yongyudha Nandidarbha. Jun 75, 130p

Descriptors: *Servomechanisms, *Data processing equipment, *Digital computers, Digital systems, Computerized simulation, Costs, Shafts(Machine elements), Theses, Analog systems, Analog to digital converters, Digital to analog converters, Coding, Servoamplifiers, Control systems, Positioning devices(Machinery).
Identifiers: IBM 360 computers.

Digital techniques can be effectively and economically used for control purpose. A digital positioning system is simulated, studied, and the results compared with the results from comparable analog system. Conventional compensation methods are used to compensate the comparable analog system and the results is used in simulation study of the digital system. (Author)

AD-A013 724/0GA PC$4.75/MF$2.25
Aeronautical Systems Div Wright-Patterson AFB Ohio
Virtual Image Display Test Results.
Final rept. May 74-Apr 75,
James C. Byrd. Apr 75, 83p Rept no. ASD-TR-75-20

Descriptors: *Display systems, Magnification, Optical lenses, Images, Optics, Cathode ray tubes, Test methods.
Identifiers: *Virtual image display systems.

The report consists of a summary of the results obtained in tests performed on the Virtual Image Display System. A detailed list of data obtained from the experiment is included as an Appendix. The data indicates that a Virtual Image lens can improve performance of airborne display systems significantly.

AD-A013 732/3GA PC$4.75/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Effects of Local Terrain and Obstacles upon Near Horizon Gain of L-Band Beacon Antennas.
Technical note,
Alex Spiridon. 17 Jul 75, 93p Rept no. TN-1975-6 ESD-TR-75-224
Contracts DOT-FA72WAI-261, F19628-76-C-0002

Descriptors: *Antennas, *Beacons, L band, Gain, Terrain, Shadows, Air traffic control systems, Radio links, Radio transmission, Electromagnetic wave reflections, Diffraction.
Identifiers: DABS(Discrete Address Beacon Systems), Discrete address beacon systems, DOT/4IZ/ID, Air traffic control radar beacon systems.

Models are given of the mechanisms that determine the effective gain of an L-band ground based antenna at near horizon elevation angles. Primary emphasis is given to the environment of typical Air Traffic Control Radar Beacon System (ATCRBS) sites.

AD-A013 849/5GA PC$4.25/MF$2.25
Dikewood Corp Los Angeles Calif
Electrically Small Ellipsoidal Antennas.
Final rept. 28 Sep 73-24 Jul 74,
K. S. H. Lee. Jul 75, 54p AFWL-TR-74-245
Contract F29601-74-C-0010

Descriptors: *Antennas, Ellipsoids, Numerical analysis, Radio fields.
Identifiers: *Electrically small antennas.

Analytical and numerical results are obtained for the equivalent area, radiation resistance, polarizabilities, and field enhancement factors of an ellipsoid or a half ellipsoid symmetrically resting on an infinite ground plane. It is shown that a simple relationship exists among these quantities.

AD-A013 917/0GA PC$4.75/MF$2.25
National Aviation Facilities Experimental Center Atlantic City N J
Development of a Stacked Five-Bay VOR Antenna System.
Final rept.,
Edward N. Lind. Jun 75, 76p Rept no. FAA-NA-74-26 FAA-RD-75-9

Descriptors: *Antenna arrays, Radio navigation, Very high frequency, Radio ranges.
Identifiers: DOT/4IZ/ID.

The report describes an operational evaluation of a single bay and a stacked five-bay VOR antenna on a conventional VOR counterpoise at the National Aviation Facilities Experimental Center (NAFEC).

AD-A013 944/4GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
A Review of Ferrites for Microwave Applications.
Journal article,
Gerald F. Dionne. 4 Dec 73, 14p Rept no. JA-4355 ESD-TR-75-192
Contract F19628-73-C-0002
Availability: Pub. in Proceedings of the IEEE, v63 n5 p777-789 May 75.

Descriptors: *Ferrites, Microwave equipment, Magnetic properties, Garnet, Sensitivity, Magnetization, Hysteresis, Reprints.

Ferrimagnetic materials for microwave applications are reviewed with emphasis on the more recent advances. Specific areas of discussion include temperature sensitivity of the magnetization, microwave loss phenomena and the concept of effective linewidth, and the hysteresis loop in terms of the factors which influence its coercive force, remanence ratio, and stress sensitivity. The relations between specific chemical substitutions and the attendant magnetic properties are then summarized for the various spinel and garnet ferrite families of interest to the microwave device engineer. Finally, the ceramic preparation of ferrite materials is outlined with special focus on some of the newer techniques. (Author)

AD-A014 081/4GA PC$5.75/MF$2.25
Sprague Electric Co North Adams Mass
Production Engineering Measure for Hybrid Integrated Circuits for Fuze Applications. Volume III. Quality Control Manual.
Final rept. 26 Jun 71-7 Nov 74,
G. H. Tully. 7 Nov 74, 149p
Contract DAAB05-71-C-2642
See also Volume 2, AD-A012 842.

Descriptors: *Integrated circuits, *Quality control, Fuzes(Ordnance), Production engineering, Hybrid circuits, Fabrication, Quality assurance, Reliability(Electronics).
Identifiers: *Production engineering measures.

The manual outlines the methods and procedures of the Quality Assurance and Reliability (QAR) Department of the Sprague Electric Company, Integrated Circuit Division, located at Worcester, Massachusetts. The manual describes the techniques used by the QAR Department to monitor product quality and reliability so the optimum product capability can be obtained. This manual was prepared to meet the requirements and intent of MIL-C-45662, MIL-I-45208, NASA Quality Publication NPC 200-3 and MIL-Q-9858A.

N75-26202/2GA PC$7.00/MF$2.25
New Mexico State Univ., Las Cruces. Physical Science Lab.
Antenna and Radome Loss Measurements for Mfmr and Pmls with Appendix on Mfmr/Pmls Computer Programs.
K. R. Carver, and W. K. Cooper. May 75, 199p
NASA-CR-141871, PA-00817
Contract NAS9-95451

Descriptors: *Antenna radiation patterns, *Computer programs, *Microwave radiometers, *Radomes, Brightness temperature, Calibrating, Data reduction, Microwave imagery, Performance tests.

For abstract, STAR 1317

N75-26778/1GA PC$5.75/MF$2.25
Advisory Group for Aerospace Research and Development, Paris (France).
Electro-Optical Systems.
May 75, 142p AGARD-LS-76

Descriptors: *Display devices, *Electro-optics, *Weapon systems, Electronic equipment, Human factors engineering, Laser applications, Optical radar, Systems engineering, Television systems.

For abstract, STAR 1317

PATENT-3 735 137 Not available NTIS
Department of the Army Washington D C
Large, Two Dimension, Screen for Converting an Optical Image Projected on One Side to an Identical Infrared Image Display on the Other Side.
Patent,
Vincent T. Bly. Filed 2 May 72, patented 22 May 73, 4p Rept nos. PAT-APPL-249 572,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Mosaics(Light sensitive), *Screens(Displays), *Image converters, *Patents, Optical images, Infrared images, Optical equipment, Dielectrics, Photoconductors.
Identifiers: PAT-CL-250-83-3-HP.

The patent is a large screen panel that has a mosaic of conductive lattices juxtaposed on opposite sides of a dielectric substrate. A layer of photoconductive material coats the lattice and substrate on the back side of the panel. A coat of electrically resistive material, or resistive black, which emits infrared energy in proprotion to its temperature, is coated over the lattice and substrate on the front of the panel. It is an object of this invention to provide a mosaic array of elements incorporating a photoconductor and an emitting surface, such that when the photoconductor is modulated by a light image, the image is emitted from the emitting surface in the infrared spectrum.

PATENT-3 747 007 Not available NTIS
Department of the Army Washington D C
Variable Compensation for Feedback Control Systems.
Patent,
Karl R. Geitner. Filed 7 Jul 72, patented 17 Jul 73, 5p Rept nos. PAT-APPL-269 683,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Control systems, *Networks, *Patents, Feedback, Compensation, Feedback amplifiers.
Identifiers: PAT-CL-330-51, Feedback control.

The patent relates to the characteristics of a compensation network for an amplifier varied in accordance with an electronic signal representing critical system parameters. A resistive reactive 'T' branch is paralleled by a switching device and resistor. The parametric signal activates the switching device and the networks are connected between the input signal and an input of the amplifier.

PATENT-3 875 394 Not available NTIS
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Correlation Type Phase Detector.
Patent.
W. D. T. Davies, and S. C. Martin. Patented 1 Apr 75, 7p PAT-APPL-353 162
Misc-Filed 20 Apr. 1973 Supersedes N73-23291 (11-14, p 1640). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Correlation detection, *Multiplexing, *Phase detectors, *Signal analysis, *Patents, Phase lock demodulators, Time division multiplexing.
Identifiers: PAT-CL-235-181.

The phase angles of each of a plurality of frequency multiplexed signals derived on a common lead and having predetermined frequencies are determined relative to

predetermined phase angles of reference waves having the same frequencies as the signals. Correlators respond to the plural signals and reference waves to derive signals indicative of the orthogonal cross correlations of one reference wave with the signal for each frequency. The correlator includes integration means that is activated for the same time period for each cross correlation of each frequency. The integration means derives, at the end of each activation period, first and second signals respectively indicative of sin phi and cos phi for each of the frequencies. A computer responds to the first and second signals for each of the frequencies to derive an indication of phi for each of the frequencies.

9F. Telemetry

PB-243 511/3GA PC$3.25/MF$2.25
Montana State Univ., Bozeman. Water Resources Research Center.
Digital Instrumentation and Telemetry for Water Resources Research.
Completion rept.,
Donald K. Weaver. Dec 74, 11p W75-09529, OWRT-B-014-MONT(1)

Descriptors: *Telemetry, *Data acquisition, *Water resources, Digital techniques, Remote sensing, Telemeter equipment, Digital systems.

The principal objective was to continue the development of digital instrumentation and telemetry for water resources research. Considerable study was made as to the specifications for the remote instrument package. Several custom data acquisition systems were built for various sponsors and the experience gained in these developments was used in the prototype development used in this study. From the system design has come the specification, design, and development of a number of system components. A digital clock and multiplexor has been developed that outputs the standard time record each time a control signal is applied to the multiplexor control input. Several transmitter and receiver units have been incorporated in remote data acquisition systems operated by other agencies.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

AD-A014 082/2GA PC$3.75/MF$2.25
Assistant Secretary of Defense (Installations and Logistics) Washington D C
Management of Defense Energy Resources. Phase II Report.
Summary rept.
22 Jul 74, 43p
See also AD-A013 554.

Descriptors: *Energy management, Military requirements, Military planning, Fuel shortages, Fuel consumption, Energy conservation, Economics, Research management, Energy storage, Department of Defense.
Identifiers: Energy requirements, Energy reserves.

Topic areas briefly discussed include: World energy situation; United States energy situation; DOD energy situation; DOD energy management: new goals and direction; Defense energy requirements and budget impact; Petroleum storage and distribution; Flexibility in fuel selection; Naval petroleum and oil shale reserves; Defense energy conservation; Energy research and development; and Organization and management.

NTIS/PS-75/690/8GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Solar Energy Collectors and Concentrators (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Audrey S. Hundemann. Sep 75, 122p*
Supersedes NTIS/PS-75/347. See also NTIS/PS-75/689.

Descriptors: *Solar collectors, *Bibliographies, *Solar energy concentrators, Flat plate collectors, Heliostats, Solar energy absorbers, Ponds, Performance evaluation, Design, Absorbers(Materials), Solar air conditioning, Heat storage, Solar power generation, Solar space heating.
Identifiers: Solar ponds.

Solar energy collectors and concentrators, including heliostats, are discussed. Abstracts cover flat plate collectors, shallow ponds, linear focused collectors, absorbers, and collectors and concentrators as they relate to solar heating and cooling of buildings and solar thermal electric power systems. Concentration of solar energy for spacecraft application is excluded except in those cases in which the technology may have terrestrial application. (Contains 117 abstracts)

N75-26497/8GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Summary of NASA Lewis Research Center Solar Heating and Cooling and Wind Energy Programs.
R. W. Vernon. 1975, 23p NASA-TM-X-71745, E-8383
Conf-Presented at the Southeastern Conf. On Appl. Of Solar Energy, Huntsville, Ala., 24-26 Mar. 1975; Sponsored by Ala. Univ.

Descriptors: *Air conditioning, *Solar heating, *Windpower utilization, Buildings, Energy policy, Performance tests, Solar collectors, Solar simulation, Windpowered generators.

For abstract, STAR 1317

N75-26500/9GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Potential Structural Material Problems in a Hydrogen Energy System.
H. R. Gray, H. G. Nelson, R. E. Johnson, B. Mcpherson, and F. S. Howard. Jun 75, 29p NASA-TM-X-71752, E-8380

Descriptors: *Fuel systems, *Hydrogen fuels, *Materials, *Structural analysis, Corrosion, Embrittlement.

For abstract, STAR 1317

PB-242 760-01/GA PC$10.00/MF$10.00
Federal Energy Administration, Washington, D.C. Office of Policy and Analysis.
Energy Information Reported to Congress. As Required by Public Law 930319. First Quarter 1975.
Quarterly rept. Jan-Mar 75.
Jun 75, 162p FEA/C-75/332
Also available on subscription $35.00/year domestic, $45.00/year foreign.

Descriptors: *Coal, *Natural gas, *Electric power generation, *Crude oil, *Petroleum products, Fuel consumption, Production rate, Fuel storage, Reserves, International trade, Nuclear power plants, Energy conservation, Electricity, Exploration, Reviews, Tables(Data), Statistical data.

The Quarterly Report is prepared on a regular basis in compliance with provisions of the Energy Supply and Environmental Coordination Act of 1974 (Public Law 93-319). Each issue contains summaries and statistical tables for the quarter on resource development and production, consumption, storage, distribution, imports, and exports of coal, natural gas, crude oil, and refined petroleum products. It also contains annually an historical appendix of summaries and data tables on fuel exploration, drilling activity, reserves, and the above figures on a one-year or ten-year scale, as the data are available. A section on the development and operation of nuclear energy and nuclear powerplants is included.

PB-243 338/1GA PC$3.25/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Tax and Other Legal Incentives to the Increased Production of Energy Resources.
Final rept.,
Michael T. Johnson, and Tom Edwards. 20 Jan 75, 22p NSF/RA/N-74-242
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Houston Univ., Tex., and Texas State Office of the Attorney General, Austin.

Descriptors: *Energy resources, *Texas, *Government policies, *Energy policy, Energy management, Taxes, Incentives, Depletion, Legislation, Allowances, Productivity, Crude oil, Natural gas, Coal, Uranium, Petroleum industry, National government, State government.

The report discusses briefly existing and proposed incentives to the increased production of energy in Texas, with the principal arguments, pro and con, presented. Among the federal incentives discussed are the percentage depletion allowance, the immediate deduction for intangible drilling costs, foreign tax credits, windfall profits tax proposals, and federal taxes affecting the production of coal and uranium. On the state side, state taxes, compulsory unitization, and increased imports through offshore drilling and deepwater port facilities, are analyzed.

PB-243 339/9GA PC$4.25/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
State/Federal Regulation of Natural Gas.
Final rept.,
Mark Lee. 29 Oct 74, 59p NSF/RA/N-74-243
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Texas State Office of the Attorney General, Austin.

Descriptors: *Natural gas, *Government policies, *Texas, History, Regulations, Legislation, National government, State government, Benefit cost analysis.

This report evaluates possible governmental responses to the disequilibrium in the supply of and the demand for natural gas. The approach includes research and the relevant literature, statutes, cases, governmental reports, quantitative data, and proposed legislation. A composite analysis provides: (1) an historical perspective of the natural gas industry and its relationship with government; (2) an examination of microeconomic concepts, the function of prices and the rationale for price regulation, which served as analytical tools for evaluating different approaches to the natural gas shortage; (3) a treatment of the pervasive issue of competitiveness within the producing segment of the gas industry; (4) a cost/benefit assessment of plausible federal policy alternatives; (5) a cursory analysis of relevant pending bills before the Congress; and (6) a description of state government action options.

PB-243 341/5GA PC$3.75/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Antitrust Considerations.
Final rept.,
Bill Marquis, Dick Peeples, and Ted Siff. 15 Oct 74, 40p NSF/RA/N-74-245
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Texas State Office of the Attorney General, Austin.

Descriptors: *Texas, *Energy policy, Energy management, Decisional law, Law(Jurisprudence), Legislation.
Identifiers: *Antitrust laws, Antitrust policies.

Rapidly rising fuel prices and the closing of many independently owned gasoline retail outlets in 1973 led to concern that antitrust laws might have been violated in the production, processing, transportation, or distribution of energy resources. Questions also arose out of the attempts of energy companies to collaborate on research and development within the constraints of the antitrust laws. This report provides a basic understanding of the antitrust laws needed in considering energy-related antitrust problems.

PB-243 343/1GA PC$7.50/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Resources and Utilization of Texas Lignite.
Final rept.,
T. F. Edgar, and J. T. Richardson. 15 Nov 74, 229p NSF/RA/N-74-247
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Texas Univ. at Austin, Dept. of Chemical Engineering, and Houston Univ., Tex. Dept. of Chemical Engineering.

Descriptors: *Lignite, *Texas, Coal gasification, Coal liquefaction, In situ combustion, Carbonization, High btu gas, Methyl alcohol, Cost analysis, Reviewing, Assessments, Environmental impacts, Synthetic fuels, Low btu gas.
Identifiers: Chars, Toscoal process, Koppers-Totzek process, Lurgi process, Carbon dioxide acceptor process, Hygas process, Bigas process, Synthane process, Hydrane process, Kellogg process, Atgas process, Wellman-Galusha process, Technology assessment.

This research assessment has consisted of an evaluation of the Texas lignite resources and their use. The work focused upon the following seven areas: (1) Supplies of domestic and Texas coals; Extraction of the coal and coal-derived energy; Transportation of coal and coal-derived energy; Conversion of coal to other energy forms; Synthetic fuel demand; Environmental factors in use of coal; and, Research and development strategy for use of lignite.

PB-243 344/9GA PC$3.75/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Potential of Solar Energy for Texas.
Final rept.,
A. F. Hildebrandt. 15 Nov 74, 44p NSF/RA/N-74-248
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Houston Univ., Tex. Dept. of Physics.

Descriptors: *Solar energy conversion, *Texas, Solar air conditioning, Solar space heating, Solar power generation, Solar energy concentrators, Heat storage, Cost analysis, Forecasting.

This report evaluates the rapidly growing solar energy program and determines which areas are appropriate for immediate development in Texas. Home heating and cooling via solar energy as well as integration of solar energy into electric and gas utilities are considered.

PB-243 346/4GA PC$4.75/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
The Implementation of a Hydrogen Energy System in Texas.
Final rept.,
C. J. Huang, and John R. Howell. 15 Dec 74, 88p NSF/RA/N-74-250
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Houston Univ., Tex.

Descriptors: *Hydrogen fuels, *Texas, Production, Econometrics, Forecasting, Cost analysis, Mathematical models, Supply(Economics), Demand(Economics), Natural gas, Scenarios.

This report discusses hydrogen as a possible substitute gaseous fuel in the mid- to long-term in Texas. It concentrates on the economics of starting a demonstration system in Texas under the present energy cost structure so that hydrogen could be available for use when future fossil fuel costs become prohibitive. Hydrogen production and distribution costs were researched, and the methods best suited to Texas were determined. A gaseous fuel supply/demand model for Texas was developed, based on an existing national natural gas model. This interactive computer model was used to project the price of natural gas scenarios. The ability of hydrogen to compete in such conditions was then examined, and the cost of state subsidies to bring hydrogen to compete in such conditions was then examined, and the cost of state subsidies to bring hydrogen into the market was forecast.

PB-243 351/4GA PC$5.75/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Potential for Solid Waste as an Energy Source in Texas.
Final rept.,
James E. Halligan, and William J. Huffman. Nov 74, 128p NSF/RA/N-74-255
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Texas Tech Univ., Lubbock.

Descriptors: *Solid waste disposal, *Texas, *Energy sources, *Reclamation, Heat recovery, Ammonia, Fuel oils, Low btu gas, Methane, Cost estimates, Fuels, Agricultural wastes, Industrial wastes, Refuse, Garbage, Oxidation, Pyrolysis, Combustion, Assessments, Electric power production, Boilers, Corrosion.
Identifiers: Technology assessment.

This report assesses the technology of solid waste conversion for application to the needs of Texas; summarizes the production rate of solid wastes in the municipal, agricultural, and industrial sectors of the state; and recommends the research-development and legislative actions required to implement energy recovery from solid wastes and those locations in Texas where such conservation processes would be feasible.

PB-243 355/5GA PC$4.75/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Petrochemicals in Texas - 1972.
Final rept.
30 Jan 74, 84p NSF/RA/N-74-259
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Pace Co., Houston, Tex.

Descriptors: *Texas, Ethylene, Propylene, Benzene, Toluene, Xylenes, Butanes, Carbon black, Elastomers, Ammonia, Methyl alcohol, Industries, Chemical industry, Industrial plants, Production capacity, United States, Comparison, Refineries.
Identifiers: *Petrochemical industry.

This report presents a comparison of the present status of major petrochemicals in Texas with the remainder of the United States including: Ethylene, propylene, benzene, toluene/xylenes, butanes/butylenes, carbon black and elastomers, and ammonia/methanol.

PB-243 470/2GA PC$8.75/MF$2.25
Hawaii State Advisory Task Force on Energy Policy, Honolulu.
Alternate Energy Sources for Hawaii.
Report of the Committee.
Feb 75, 276p NSF/RA/G-75/003
Grant NSF-ISR71-03844-A03
Prepared in cooperation with Hawaii State Dept. of Planning and Economic Development, Honolulu, and Hawaii Natural Energy Inst., Honolulu.

Descriptors: *Energy sources, *Hawaii, *Energy conversion, Waste disposal, Plants(Botany), Hydroelectric power, Wind power, Nuclear power, Geothermal energy conversion, Solar energy conversion, Solar sea power plants, Waterwave energy conversion, Coal, Energy storage, Environmental impacts, Economics, Energy policy.
Identifiers: Solid wastes.

This is a report of the Committee on Alternate Energy Sources for Hawaii, which was established by the Governor's State Advisory Task Force on Energy Policy to help respond to problems created by the Arab oil embargo. Fourteen studies were undertaken -- ten on alternate energy sources, and four more general studies. Included as appendices to the report are all the studies on the potential of different energy sources to minimize the State's near-total dependence on seaborne petroleum. These alternate sources of energy are: solid waste; bioconversion; hydroelectric; wind; geothermal; solar collectors; ocean thermal energy conversion; waves, tides, currents, osmosis; coal; nuclear.

PB-243 575/8GA PC$5.75/MF$2.25
Mitre Corp., McLean, Va.
Analysis of Steam Coal Sales and Purchases.
M. T. Lethi, J. Elliott, D. Ellis, and E. P. Krajeski.
Apr 75, 139p* MTR-6878 FEA/G-75/348
Contract FEA-C-05-50110-00

Descriptors: *Coal, *Electric utilities, Prices, Marketing, Market value, Cost analysis, Economics, Supply contracts, Purchasing, Forecasting.

This report provides specific information on the steam coal market. It investigates: coal purchasing and sales practices, factors influencing coal prices, and current and future contractual relationships between buyers and sellers. Potential problems in coal use and production and recommendations for solving these problems are identified.

PB-243 580/8GA PC$4.25/MF$2.25
Federal Energy Administration, Washington, D.C.
Report to Congress on Economic Impact of Energy Actions.
Feb 75, 52p FEA/B-75/279

Descriptors: *Energy shortages, *Economic impact, Crude oil, Petroleum products, Fuel consumption, International trade, Wholesale price index, Gross national product, Fixed investment, Balance of trade, Reserves, Allocation, Price regulations, Reviews.

This report examines the impact of energy shortages on the economy for July 1 to October 10, 1974. It is published every six months to supply Congress with information regarding the impact of energy shortages on employment and the economy. The study examines the

evolution of the energy shortage and the impacts, where discernible and measurable, on employment and the general economic situation; it also examines the economic effects of the Mandatory Petroleum Allocation and Price Regulations.

PB-243 592/3GA PC$9.25/MF$2.25
National Science Foundation, Washington, D.C.
Abstracts of NSF/RANN Research Reports October 1970-December 1974.
May 75, 323p* NSF-75-6

Descriptors: *Energy, *Bibliographies, Research, Abstracts, Solar energy, Heating, Cooling, Wind power generation, Biological secondary recovery, Ocean engineering, Geothermy, Direct energy conversion, Energy storage, Energy resources, Systems engineering, Transportation, National government.
Identifiers: *National Science Foundation.

This bibliography contains citations and abstracts of documents received by the National Science Foundation from research sponsored by the RANN (Research Applied to National Needs) program in the area of energy research and technology.

PB-243 627/7GA PC$4.25/MF$2.25
Faucett (Jack) Associates, Inc., Chevy Chase, Md.
Defining and Estimating Opportunity Costs for Energy Resources.
Final technical rept.,
Ernest J. Mosbaek. 14 Jun 74, 72p JACKFAU-74-111(2) NSF/RA/N-74-210
Grant NSF-GI-40902

Descriptors: *Energy policy, Energy consumption, Econometrics, Benefit cost analysis, Marketing, Decision making, Planning.

This report and the proposed research is focused on applying two of the most fundamental principles of economics (logic) to energy market prices should reflect the minimum true social cost of energy consumption; and decisions on production and consumption should be made by millions of decentralized decision makers guided by market prices, by their self-interest, and by their intimate knowledge of costs, values, and substitutions. No allocations scheme outside of market prices offers significant hope for using the intimate knowledge and motivation of millions of decentralized decision makers and for attaining the self-correcting property of good market operations.

PB-243 751/5GA PC$4.25/MF$2.25
Aerospace Corp., El Segundo, Calif. Energy and Resources Div.
Central Receiver Solar Thermal Power System. Review and Summary of Available Test Facilities.
Jan 75, 72p ATR-75(7370)-2 NSF/RA/N-75/039B
Contract NSF-C933
See also PB-243 752.

Descriptors: *Solar simulators, *Solar energy conversion, *Test facilities, Solar furnaces, Heat storage, Optical measurement, Radiant heating, Reviewing, Solar thermal power plants, Site selection, Planning, Pilot plants.

The report documents the results of a study to define siting criteria and identify alternative solar power plant sites for a planned 10 MWe Central Receiver Proof-of-Concept Experiment (POCE) Pilot Plant. Technical and institutional criteria were developed and applied to identify twenty potentially suitable general locations. Facilities exist at these locations that could potentially supply logistical support during design, construction, and operation (at some locations) of the POCE.

PB-243 752/3GA PC$6.25/MF$2.25
Nebraska Univ., Lincoln. Water Resources Research Inst.
Solar Thermal Conversion Central Receiver Pilot Plant Siting.
31 Jan 75, 151p ATR-75(7370)-3 NSF/RA/N-75/039C
Contract NSF-C933
See also PB-243 129 and PB-243 751.

Descriptors: *Solar energy conversion, *Solar thermal power plants, *Site selection, *Pilot plants, Planning, Arizona, California, New Mexico, Nevada, Oklahoma, Texas.

This report documents the results of a study to define siting criteria and identify alternative solar power plant sites for a planned 10 MWe Central Receiver Proof-of-Concept Experiment (POCE) Pilot Plant. Technical and institutional criteria were developed and applied to identify twenty potentially suitable general locations. Facilities exist at these locations that could potentially supply logistical support during design, construction, and operation (at some locations) of the POCE. These potentially suitable locations were subsequently examined to assess climatological factors and to identify typical sites within the general area. A total of 29 sites were identified in the six southwestern states of Arizona, California, New Mexico, Nevada, Oklahoma, and Texas. Both favorable and unfavorable climatological features were identified at each site.

10B. Power Sources

AD-A013 921/2GA PC$3.25/MF$2.25
Globe-Union Inc El Monte Calif Centralab Semiconductor Div
Hardened Violet Response Silicon Solar Cell for Satellite Application.
Final rept. Jun 73-Apr 75,
P. A. Iles. May 75, 50p AFAPL-TR-75-20
Contract F33615-73-C-2073

Descriptors: *Solar cells, *Silicon, Spacecraft components, Radiation hardening, Performance tests, Radiation effects, Electrical resistivity, Aluminum.
Identifiers: *Spacecraft power supplies.

This contract involved development of further hardened versions of violet response solar cells, by adding aluminum contacts, and by testing the effects of higher resistivity silicon. The conventional violet cells improved steadily in output during the contract (70-79 mw 2x2 Cm) There were difficulties in applying suitable fine line aluminum contacts to the shallow diffused front surface of the cell. The best violet cells with aluminum contacts were about 10% lower in output than the usual violet cells. Radiation tests showed that low resistivity (1-3 ohm-cm) silicon still gave best overall cell performance. Limited environmental tests showed that the performance of violet cells was satisfactory. More intensive study of the overall contact properties is suggested. Violet cells with both conventional and aluminum contacts, and covering a decade of bulk resistivity values, were delivered for evaluation, and for associated tests.

AD-A014 067/3GA PC$3.75/MF$2.25
American Univ Washington D C
Research on Electrochemical Energy Conversion Systems.
Interim progress rept. no. 6, Apr-Oct 74,
Alayne A. Adams, and Robert T. Foley. Mar 75, 29p
Contract DAAK02-72-C-0084
See also report dated Jul 74, AD-786 685.

Descriptors: *Fuel cells, *Electrolytes, Electrochemistry, Sulfonic acids, Phosphoric acids, Carbinols, Hydrogen, Oxidation, Propane, Performance(Engineering), Laboratory tests, Temperature, Reliability(Electronics).
Identifiers: Hydrocarbon air fuel cells, Propane air fuel cells, Fuel cell electrolytes, Methane sulfonic acid/trifluoro.

The research has involved work on two tasks: a search for electrolytes alternative to phosphoric acid for direct and indirect hydrocarbon-air fuel cells, and a study of the corrosion characteristics of electrolytes for intermediate-temperature hydrocarbon-air fuel cells. The effort during this reporting period has been concentrated on the further investigation of the electrochemical behavior of trifluoromethanesulfonic acid monohydrate as a fuel cell electrolyte. The studies dealt with the use of methanol as a fuel, both from electrooxidation at a platinum electrode and from its tendency to interfere with the air electrode. Methanol dissolved in CF3SO3H.H2O was electrooxidized over a temperature range of 23C to 135C with the highest rate in the neighborhood of 80C. At temperatures above 100C vaporization losses are excessive. Methanol interferes with the air electrode. The electrochemical activities of hydrogen, propane, and air were investigated at a platinum electrode in CF3SO3H.H2O at 23C.

MND-3251-3 PC$4.00/MF$2.25
Martin Marietta Corp., Baltimore, Md.
Research and Technology Implications Report, Saturn-Rips Study.
Feb 66, 16p

Descriptors: (*Spacecraft power supplies, Snap batteries), (*Snap batteries, *Research programs), (*Radioisotope heat sources, Research programs), Plutonium 238, Polonium 210, Space flight, Thermionic converters, Thermoelectric generators.

For abstract, see NSA 32 03, number 06227.

MND-3607-131-2 PC$8.25/MF$2.25
Martin Marietta Corp., Baltimore, Md.
Snap Power System for Dodge-M Satellite, Technical Description.
Mar 67, 104p

Descriptors: (*Spacecraft power supplies, Snap 19 battery), (*Snap 19 battery, *Comparative evaluations), (*Thermoelectric generators, *Design), Performance, Radioisotope heat sources, Satellites.

For abstract, see NSA 32 03, number 06228.

MND-5209 PC$6.50/MF$2.25
Martin Marietta Corp., Baltimore, Md.
Modified Snap 19 for Navy Navigation Satellite.
20 Feb 68, 66p

Descriptors: (*Satellites, *Spacecraft power supplies), (*Snap 19 battery, *Performance), Mechanical tests, Radioisotope heat sources, Safety, Snap 11 battery, Thermoelectric generators.

For abstract, see NSA 32 03, number 06229.

NTIS/PS-75/691/6GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Solar Electric Power Generation (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Audrey S. Hundemann. Sep 75, 149p*
Supersedes NTIS/PS-75/346. See also NTIS/PS-75/690.

Descriptors: *Solar power generation, *Bibliographies, *Solar thermal power plants, *Electric power generation, Solar sea power plants, Solar cells, Photovoltaic cells, Design, Site selection, Planning, Feasibility, Solar ener-

gy conversion, Thermoelectric power generation.

Abstracts pertaining to terrestrial electric power generation by both direct conversion with solar cells and indirect conversion using solar heat are presented. Included are abstracts dealing with solar sea power. Topic areas cover equipment design, site surveys, and feasibility studies. (Contains 144 abstracts)

NTIS/PS-75/692/4GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Optical Coatings for Solar Cells and Solar Collectors (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Edward J. Lehmann. Sep 75, 94p*
Supersedes NTIS/PS-75/137. See also NTIS/PS-75/691.

Descriptors: *Optical coatings, *Bibliographies, *Solar collectors, *Solar cells, Solar energy absorbers, Solar energy concentrators, Weatherproofing, Solar space heating, Stannates, Infrared filters, Abstracts.
Identifiers: Cadmium stannates.

Materials and research for the development of selective coatings for solar energy conversion devices are described in these citations of Federally-funded research. These materials include types of coatings or covers used to reflect or transmit solar radiation in order to optimize solar conversion to heat or electricity. Also presented is research on covers or coatings which protect against thermal, radiation, or environmental damage. (Contains 89 abstracts)

NTIS/PS-75/693/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Cadmium Sulfide Solar Cells (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Mona F. Smith. Sep 75, 186p*
Supersedes NTIS/PS-75/089.

Descriptors: *Bibliographies, *Solar cells, Cadmium sulfides, Design, Fabrication, Degradation, Semiconducting films, Photovoltaic effect, Thin films, Band structure of solids, Barrier coatings, Optical filters, Abstracts.
Identifiers: *Cadmium sulfide solar cells, Copper sulfides.

The citations cover cadmium sulfide solar cell development and use including their design, theory, fabrication, characteristics and degradation. (Contains 181 abstracts)

N75-26496/0GA PC$5.75/MF$2.25
Pratt and Whitney Aircraft, South Windsor, Conn.
Development of Advanced Fuel Cell System, Phase 3.
Final Report.
L. M. Handley, A. P. Meyer, and W. F. Bell. 30 Jan 75, 131p NASA-CR-134818, PWA-5201
Contract NAS3-15339

Descriptors: *Electrocatalysts, *Electrochemistry, *Hydrogen oxygen fuel cells, *Spacecraft power supplies, Life (Durability), Performance prediction, Space tugs, Vapor deposition.

For abstract, STAR 1317

PAT-APPL-534 328/GA PC$3.25/MF$2.25
Energy Research and Development Administration, Washington, D.C.
Production of MHD Fluid.
Patent Application,
James J. Lacey, Roy C. Kurtzrock, and Daniel Bienstock. Filed 19 Dec 74, 14p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Magnetohydrodynamic generation, *Plasmas(Physics), Combustion products, Purification, Ash content, Flue gases.
Identifiers: *Coal fired MHD generators.

The patent application covers the development of hot gaseous fluid of low ash content, suitable for use in open-cycle MHD (magnetohydrodynamic) power generation. It is produced by means of a three-stage process comprising (1) partial combustion of a hydrocarbon fuel to produce a hot gaseous product comprising CO2, CO and H2O, (2) reformation of the gaseous product from stage (1) by means of a fluidized char bed, whereby CO2 and H2O are converted to CO and H2 from stage (2) to produce a low ash-content fluid (flue gas) comprising CO2 and H2O and having a temperature of about 4000 to 5000F.

PATENT-3 745 127 Not available NTIS
Department of the Army Washington D C
Composition of Matter Containing Carbon.
Patent,
William J. Asher. Filed 20 Mar 72, patented 10 Jul 73, 2p Rept nos. PAT-APPL-236 170,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Electrodes, Fuel cells, Carbon, Catalysts, Coatings, Silicates, Aluminum compounds.
Identifiers: PAT-CL-252-446, *Fuel cell electrodes, Hydrocarbon air fuel cells, Catalyst supports, Alumino silicates, Hydrocarbon oxygen fuel cells.

The general object of this invention is to provide a new composition of matter for the fuel cell electrode of a hydrocarbon-air fuel cell in which improved platinum utilization is obtained. A further object of the invention is to provide a high surface area base support onto which a catalyst such as platinum can be deposited. According to the invention, a new composition of matter is provided. It is an alumino silicate on porous carbon. The alumino silicate exists as a layer tetrahedra of aluminum and silicon atoms each surrounded by four oxygen atoms. This layer is deposited on the walls of the pores of the carbon particles.

PATENT-3 865 632 Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Terminal for Thermoelectric Element.
Patent,
Norbert E. Elsner, Louis W. Perry, Jr., Michael R. Emken, and Elmer J. Steeger. Filed 23 Apr 73, patented 11 Feb 75, 4p PAT-APPL-353 253
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Thermoelectric generators, *Patents, *Electric terminals, Thermoelectric materials.
Identifiers: PAT-CL-136-237.

The patent describes a terminal construction for a thermoelectric element. A thermally and electrically conductive cap is provided with a recess, against the bottom of which is welded woven wire screening. Powdered thermoelectric material is pressed into the recess, through the screening and against the bottom of the recess, interlocking mechanically with the mesh and forming a permanent thermal and electrical connection to the cap.

PB-243 345/6GA PC$6.25/MF$2.25
Texas Governor's Energy Advisory Council, Austin.
Alternatives for the Texas Electric Power Industry.
Final rept.,
H. H. Woodson, and C. D. Zinn. 15 Oct 74, 160p NSF/RA/N-74-249
Grants NSF-GI-44085, NSF-SIA73-05812
Prepared in cooperation with Texas Univ. at Austin.

Descriptors: *Electric power generation, *Texas, Gas turbine power generation, Nuclear electric power generation, Gas cooled reactors, Breeder reactors, Power reactors(Nuclear), Coal gasification, Coal liquefaction, Nuclear fusion, Molten salt nuclear reactors, Forecasting, Electric utilities, Fuel cells, Magnetohydrodynamic generators, Electric power transmission, Electric power distribution, Assessments.
Identifiers: Technology assessment.

This report assesses technologies that may have an impact on the generation and transmission of electric energy for the state of Texas for the time period 1982 to 2000. Topic areas covered include: Light water reactors; High temperature gas cooled reactors; Breeder reactors; Offshore nuclear power plants; Fusion; Molten salt breeder reactor (MSBR); Direct combustion of coal; Gasification of coal; Liquefaction of coal; Gas turbines and combined cycles; Fuel cells; Magnetohydrodynamics and Transmission technologies.

PB-243 810/9GA PC$4.25/MF$2.25
Southern Methodist Univ., Dallas, Tex.
Development of Low-Cost Thin Film Polycrystalline Silicon Solar Cells for Terrestrial Applications.
Semi-annual progress rept. 1 Jan-30 Jun 75,
Ting L. Chu. Jul 75, 59p NSF/RANN/SE/AER-73-07843/PR/75/2 NSF/RA/N-75-048
Grants NSF-AER73-07843-A01, NSF-GI-38981
See also TID-26824. Prepared in cooperation with Texas Instruments, Inc., Dallas.

Descriptors: *Solar cells, *Silicon, *Semiconducting films, Thin films, Substrates, Graphite, Semiconductor junctions, Czochralski method, Crystal growth, Doping, Vapor deposition, Purification, Crystallization, Fabrication, Zone melting.
Identifiers: Chemical vapor deposition.

This research program has the objective of developing low-cost thin film polycrystalline silicon solar cells suitable for large-scale terrestrial utilization. Silicon deposited on carbon/graphite substrates are similar to silicon deposited on graphite substrates in microstructure, crystallographic properties, and solar cell characteristics. A zone-melting technique has been developed for the recrystallization of silicon on graphite substrates. Silicon solar cells with AMO efficiencies up to 2.5 percent have been produced. The grain boundary effects in silicon solar cells of the configuration n(+)/p/cast metallurgical-grade silicon were reduced by increasing the dopant concentration in the p-layer, and AMO efficiencies up to 3.5 percent were obtained. Solar cells deposited on Czochralski polycrystalline metallurgical silicon substrates had higher efficiencies, about 4.2 percent. Metallurgical silicon has been purified by the chemical treatment of the melt and float-zone refining. Solar cells with AMO efficiencies of about 4.5 percent were obtained from two-zone pass material.

PB-243 835/6GA PC$3.75/MF$2.25
Colorado State Univ., Fort Collins. Solar Energy Applications Lab.
Solar Thermal Electric Power Systems. Volume I. Executive Summary.
Final rept.
Nov 74, 49p* NSF/RANN/SE/GI-37815/FR/74/3-Vol-1 NSF/RA/N-74-196
Grant NSF-GI-37815
See also Volume 2, PB-243 836. Prepared in cooperation with Westinghouse Electric Corp., Pittsburgh, Pa.

Descriptors: *Solar energy concentrators, *Steam electric power generation, Gas turbine power generation, Performance evaluation, Solar heating, Optimization, Design, Cost analysis, Design, Heat storage, Heat transmission, Computerized simulation, Dynamic programming.
Identifiers: *Heliostats, Flat plate collectors, *Solar thermal power plants.

The objective of the research program is to develop design parameters of systems for thermal/mechanical coversion of solar energy to electric power at minimum cost per kilowatt-hour generated. Systems of 3MW to 300MW sizes in a public utility network are considered. Volume 1 is an Executive Summary which contains brief summaries of the procedures, results, conclusions and recommendations developed from the study. The three basic plant concepts considered for preliminary evaluation are: (1) a non-focusing collector system using pressurized water at a temperature of 150C; (2) a line-focusing collector system using steam transport at 250C; and (3) a multiple tower/heliostat system generating steam at a temperature of 350C. Sketches of solar thermal power plant configurations and concepts of some components are shown.

PB-243 836/4GA PC$7.50/MF$2.25
Colorado State Univ., Fort Collins.
Solar Thermal Electric Power Systems. Volume 2. Systems Studies and Economic Evaluations.
Final rept.
Nov 74, 235p* NSF/RANN/SE/GI-37815/FR/74/3-Vol-2 NSF/RA/N-74-197
Grant NSF-GI-37815
See also Volume 1, PB-243 835 and Volume 3, PB-243 837. Prepared in cooperation with Westinghouse Electric Corp., Pittsburgh, Pa.

Descriptors: *Solar energy concentrators, *Steam electric power generation, Gas turbine power generation, Solar heating, Performance evaluation, Capitalized costs, Optimization, Dynamic programming, Computerized simulation.

The objective of the research program is to develop design parameters of systems for thermal/mechanical coversion of solar energy to electric power at minimum cost per kilowatt-hour generated. Systems of 3MW to 300MW sizes in a public utility network are considered. Parametric performance and cost models are derived for key elements of the systems. A sequential optimization program was developed using these models to determine optimum subsystem sets and combinations which yield the least capital cost plants. A dynamic simulation program was developed to determine annual electric power produced by solar power ystems at specific locations. Electric energy cost comparisons are made to select promising systems for generation of electricity from solar energy. Volume 2 titled System Studies and Economic Evaluations, contains descriptions of methodology, parametric performance and cost models, descriptions of solar power plants which have the potential to produce low-cost electric energy, and detailed conclusions and recommendations.

PB-243 837/2GA PC$15.25/MF$2.25
Colorado State Univ., Fort Collins.
Solar Thermal Electric Power Systems. Volume 3. Appendices.
Final rept.
Nov 74, 639p* NSF/RANN/SE/GI-37815/FR/74/3-Vol-3 NSF/RA/N-74-198
Grant NSF-GI-37815
See also Volume 1, PB-243 835. Prepared in cooperation with Westinghouse Electric Corp., Pittsburgh, Pa.

Descriptors: *Solar energy concentrators, *Steam electric power generation, Gas turbine power generation, Solar heating, Performance evaluation, Cost analysis, Optimization, Heat storage, Heat transmission, Design, Dynamic programming, Computer simulation.
Identifiers: *Heliostats, *Solar thermal power plants, Flat plate collectors.

The objective of the research program is to develop design parameters of systems for thermal/mechanical conversion of solar energy to electric power at minimum cost per kilowatt-hour generated. Systems of 3MW to 300MW sizes in a public utility network are considered. Volume 3, Appendices, contains the details of the study which are summarized in Volumes 1 and 2. Portions of this document are not fully legible.

PB-243 871/1GA PC$6.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. School of Engineering.
Superconductors in Large Synchronous Machines.
Final rept.,
Joseph L. Smith. Jun 75, 168p EPRI-RP92-FR

Descriptors: *Superconductors, *AC generators, *Synchronous motors, Armatures, Rotors, Magnetic fields, Shielding, Cryogenics.

The focus of the work is the application of superconductors in the rotating field windings of large synchronous machines for power system applications. The objectives of the program have been to establish a sound base for this technology, and to demonstrate its prospects, as well as to encourage the involvement of equipment manufacturers. In the course of the program, two experimental superconducting alternators have been built and tested. Extensive analysis and exploratory design work has been performed. The report includes administrative data, descriptions of experiments, discussion of analysis, machine design philosophy, and a summary of continuing work. Eighty-six reports and papers are reviewed and referenced for complete technical detail. The significant conclusion is that it is possible to construct turboalternators and synchronous condensers which offer significant advantages over conventional machines.

10C. Energy Storage

AD-A013 931/1GA PC$3.75/MF$2.25
Spectrolab Sylmar Calif
Electrochemical Impregnation of Sintered Nickel Structures with Cadmium Using Constant Current Step and Alternating-Current Pulse Techniques.
Interim rept. Jan 71-Jun 74,
David F. Pickett, and Vincent Puglisi. Jun 75, 29p AFAPL-TR-74-119
Contract F33615-75-C-2012
Presented at the Electrochemical Society Meeting (146th), New York, N.Y., 14-17 Oct 74.

Descriptors: *Nickel cadmium batteries, *Electrodes, Cadmium compounds, Fabrication, Impregnation, Reliability(Electronics), Spacecraft components, Alternating current.
Identifiers: Cadmium hydroxides.

Cadmium electrodes, made by impregnation of sintered nickel plaques with cadmium hydroxide by three electrochemical techniques followed by formation to cadmium, can be used as efficient electrodes in nickel-cadmium secondary cells yielding capacities as high as 9.8 A-hr/cu in. for aerospace secondary power. In flooded, negative limited cells electrodes made with a constant current step technique retained 80% of the original capacity after 750 cycles at 100% depth of discharge, over a varying temperature range from 21 to 43C. Alternating current pulse techniques, either symmetric or asymetric with respect to time, can yield electrodes with loadings of 2.1 - 2.3 g. of Cd(OH)2 per cubic centimeter of void. These electrodes show promise of being efficient for use in either flooded or starved electrolyte cells.

AD-A014 066/5GA PC$3.75/MF$2.25
Eagle-Picher Co Joplin Mo Couples Dept
Non-Hazardous Primary Lithium Organic Electrolyte Batteries.
Final rept. 20 Jun 73-30 Mar 75,
J. Giltner. Jul 75, 50p ECOM-73-0269-F
Contract DAAB07-73-C-0269

Descriptors: *Primary batteries, *Hazards, Lithium, Test methods, Heat, Ventilation, Safety.
Identifiers: Design, *Lithium cells, Organic batteries.

This report describes the design and testing of the BA-5590()/U which is a primary, lithium-organic electrolyte battery. The intent of the program is the development of a battery which will be rendered safe under various severe conditions of storage, use and disposal.

PB-243 872/9GA PC$3.75/MF$2.25
ESB, Inc., Yardley, Pa. Power Technology Dept.
Sodium Chloride Battery Development Program for Load Leveling.
Interim rept. 1 Apr-31 Dec 74,
J. Werth. Jun 75, 27p EPRI-RP109-2-1

Descriptors: *Storage batteries, *Fused salts, *Sodium chloride, Electric power plants, Aluminum oxides, Solid electrolytes, Battery separators, Battery electrolytes, Cost estimates, Reliability(Electronics), Life tests.
Identifiers: *Fused salt batteries.

The ESB sodium chloride cell consists of a molten sodium negative, a beta alumina solid electrolyte also serving as a separator, and a positive mix containing both molten sodium chloroaluminate and a faradaic additive. The goal of the project is to develop a battery with a manufacturing cost less than 1/3 that of industrial lead-acid batteries and a service and cycle life of at least 10 years. Long life, on the order of 2500 to 5000 deep cycles, is expected since there are no solid-solid transformations in either the negative or positive compartments. Based on the performance of laboratory-scale cells, the overall battery module proposed for load leveling is expected to have a specific energy of at least 45 watt hrs/lb (100 Whr/kg) and possibly more. A program aimed at improving the quality of beta alumina tubes and at running life tests of tubular cells was given high priority and is now producing tubes with resistivities of about 20 ohm-cm at 200C and significantly better mechanical properties.

11. MATERIALS

COO-2459-1 PC$9.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Report of the APS Summer Study on Physics Problems Relating to Energy Technologies: Radiation Effects on Materials.
F. L. Vook, H. K. Birnbaum, and T. H. Blewitt. Jun 74, 122p

Descriptors: (*Metals, *Physical radiation effects), (*Alloys, Physical radiation effects), (*Dielectric materials, Physical radiation effects), (*Semiconductor materials, Physical radiation effects), Fbr type reactors, Neutron beams, Point defects, Reactor materials, Reviews, Superconductors, Thermal reactors, Thermonuclear reactors.

For abstract, see NSA 32 03, number 07185.

11A. Adhesives and Seals

PATENT-3 870 099 Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Seal Assembly.
Patent,
Walter Wolowodiuk. Filed 19 May 72, patented 11 Mar 75, 7p PAT-APPL-254 973
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Seals(Stoppers), *Patents, Heat exchangers, Annuli.
Identifiers: PAT-CL-165-82.

The patent describes an annular seal assembly between concentric sidewalls which will not prevent the sidewalls from being moved axially with respect to one another. The seal assembly is positioned by two lips, one on each sidewall and has a seal wall engaging one of the lips, a sealing ring engaging against the seal wall, the sealing ring being urged away from the lip on which said sealing wall is mounted and towards the other lip and a seating surface which is connected with the other lip and moveable away from the sealing ring when the other lip is moved axially.

11B. Ceramics, Refractories, and Glasses

AD-A013 682/0GA PC$3.25/MF$2.25
Aerospace Research Labs Wright-Patterson AFB Ohio
High Temperature Deformation Behavior of Ceramics.
Final rept. Aug 67-Jul 75,
Patrick K. Talty. Jun 75, 10p Rept no. ARL-75-0156

Descriptors: *Ceramic materials, *Creep, *Deformation, *Zirconium oxides, Yttrium oxides, Heat flux, Heaters, Wind tunnels, High temperature.
Identifiers: Wind tunnel heaters.

Studies have been conducted to define the creep behavior of high temperature ceramic materials of interest to the Air Force. The results of a study of yttria stabilized zirconia, a material used in regenerative storage heaters for blow down wind tunnels, are summarized. References to publications that present the details of this study are given.

AD-A013 722/4GA PC$11.50/MF$2.25
Aerospace Corp El Segundo Calif Chemistry and Physics Lab
Handbook of the Infrared Optical Properties of A12O3, Carbon, MgO, and ZrO2. Volume I.
Interim rept.,
Milo E. Whitson, Jr. 4 Jun 75, 469p Rept no. TR-0075(5548)-2-Vol-1 SAMSO-TR-75-131-Vol-1 Contract F04701-74-C-0075

Descriptors: *Carbon, *Magnesium oxides, *Zirconium oxides, *Infrared radiation, Ceramic materials, Oxides, Alumina, Refractive index, Emissivity, Reflectivity, Absorption(Physical), Transmittance, Tables(Data), Data processing, Handbooks.
Identifiers: *Aluminum oxide.

Volume 1 of this handbook presents the compiled results of a comprehensive survey of the open literature relevant to the infrared optical properties of aluminum oxide, carbon, magnesium oxide, and zirconium dioxide. Literature data were critically reviewed and representative data chosen on mathematically constructed for refractive and extinction indices, spectral and total emissivities, reflectance, and transmittance over the 1 to 1000 micrometer spectral range. All data are presented in both graphic and tabular format, and a cross-referenced bibliography is included.

AD-A013 723/2GA PC$12.00/MF$2.25
Aerospace Corp El Segundo Calif Chemistry and Physics Lab
Handbook of the Infrared Optical Properties of Al(2)O(3), Carbon MgO, and ZrO2. Volume II.
Interim rept.,
Milo E. Whitson, Jr. 4 Jun 75, 479p Rept no. TR-0075(5548)-2-Vol-2 SAMSO-TR-75-131-Vol-2 Contract F04701-74-C-0075
See also Volume 1, AD-A013 722.

Descriptors: *Carbon, *Magnesium oxides, *Zirconium oxides, *Infrared radiation, Graphite, Thin films, Refractive index, Emissivity, Reflectivity, Transmittance, Raman spectra, Tables(Data), Data processing, Handbooks.
Identifiers: *Aluminum oxide, Glassy carbon, Pyrolytic graphite, Soot.

Volume II of the handbook presents the compiled results of a comprehensive survey of the open literature relevant to the infrared optical properties of carbon soots, graphite, glassy carbon, carbon films, pyrolitic graphite, MgO and oxide stabilized ZrO2. Literature data are presented for refractive and extinction indices, spectral and total emissivities, reflectance, and transmittance over the 1 to 1000 micrometer spectral range.

AD-A014 050/9GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Ultrasound Characteristics of Some Industrial Glasses,
G. N. Burovsteva, N. M. Pavlushkin, and R. Ya. Khodakovskaya. 29 Apr 75, 8p Rept no. FSTC-HT-23-0627-75
Trans. of Khimiko-Tekhnologicheskii Institut, Moscow. Trudy (USSR) n68 p3-6 1971.

Descriptors: *Glass, *Ultrasonic properties, Acoustic velocity, Acoustic delay lines, Digital computers, Translations, USSR.

Experimental data of the authors and data in the literature, on the physical-chemical properties and ultrasound characteristics of numerous glasses were presented and discussed. Recommendations were made for use of certain glass systems with minimum sound velocities and minimum temperature coefficients of velocity for ultrasound line delays.

AD-A014 051/7GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
Study of Wetting of Samples of the BN-B4C System by Liquid Metals,
A. D. Panasyuk, and T. V. Dobovik. 29 Apr 75, 9p Rept no. FSTC-HT-23-0629-75
Unedited trans. of Dielektriki (USSR) n2 p121-125 1972.

Descriptors: *Wetting, *Boron carbides, *Boron nitrides, *Liquid metals, Refractory materials, Translations, USSR.

Production and testing of the wetting of BN, B4C and materials based on them by liquid metals are discussed. Results are presented as graphs and discussed. The results indicate the possibility of use of BN-B4C system materials as refractories with reactive metal melts.

AD-A014 053/3GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
The Work of the State Institute of Glass in the Area of Glass Hardening,
O. K. Botvinkin, and O. N. Denisenko. 29 Apr 75, 6p Rept no. FSTC-HT-23-0628-75
Trans. of Vsesoyuznyi Nauchno-Issledovatelskii Institut Stekla. Trudy (USSR) n1 p107-109 1971.

Descriptors: *Glass, *Hardening, Heat treatment, Fused salts, Lithium compounds, Sodium, Ion exchange, Silicones, Coatings, Etching, Translations, USSR.

An ion exchange method of hardening glass, by treating it in molten lithium salts, replacing the sodium ions by lithium, is described. Also mentioned are developed work on chemical hardening of glass in liquids, with subsequent application of organosilicon protective coatings, use of ultrasound in chemical hardening of glass, chemical hardening and subsequent production of double sheet glass, with recycling of the etching agent, search for polymer coatings and methods of application of them to sheet and packaging glass and special purpose glass. A method now in production of horizontal tempering of automobile glass is mentioned.

AD-A014 055/8GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
A Study of the Fine Structure, Thermomechanical and Chemical Properties of Photo-pyroceramics Containing Beryllium,
A. I. Berezhnoi, and A. S. Krasnikov. Apr 75, 9p Rept no. FSTC-HT-23-0757-75
Unedited trans. of Vsesoyuznoe Khimicheskoe Obshchestvo. Zhurnal (USSR) v16 n4 p476-477 1971.

Descriptors: *Beryllium, *Glass, *Ceramic materials, X ray diffraction, Hardness, Deformation, Crystal structure, Thermal expansion, Thermomechanics, Translations, USSR.
Identifiers: Pyroceramics.

This article discusses research on adding beryllium to light-sensitive glass and photo-pyroceramics. Crystalline structure was studied by X-ray diffraction analysis. Microhardness and microdeformation were studied in relation to varying quantities of beryllium. Results showed that there is a connection between beryllium content and fine structure and thermomechanical properties of photo-pyroceramics. The addition of BeO stabilizes thermal expansion by preventing structure transformation of various forms of silica.

AERE-R-7958 PC$4.00/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Preparation and Properties of Vanadium Dioxide Films.
F. A. Smith, and A. E. Hughes. Feb 75, 14p
U.S. Sales Only.

Descriptors: (*Vanadium oxides, *Electrical properties), Films, Optical properties, Oxygen, Pressure dependence, Sputtering, Stoichiometry.

For abstract, see NSA 32 03, number 06954.

COM-75-50462/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Fluorescence of Commercial Porous High Silica Glasses.
Final rept.,

Barbara F. Howell, Rance A. velapoldi, and John C. Travis. May 75, 4p
Pub. in American Ceramic Society Bulletin, v54 n5 p503-505, 509 May 75.

Descriptors: *Silica gas, *Fluorescence, Mossbauer effect, Tin.
Identifiers: Reprints.

Fluorescence and Mossbauer spectroscopy in conjunction with elemental analysis have been used to verify that the fluorescence which develops in commercial porous glass sintered under reducing conditions, is due to Sn(II). The fluorescence shown by in-house-formulated, porous, high silica glass impregnated with Sn(II)C12 and sintered under various conditions is used to substantiate this conclusion. Corrected fluorescence spectra for the Sn(II) species and isomer shifts and quadrupole splitting for various tin species in glasses are also given.

JUL-1128-RW PC$6.50/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorwerkstoffe und Heisse Zellen.
Contribution to the Development of Reactor Graphites and Pyrocarbons: Irradiation Behaviour, Model Conceptions, and Characterization. Papers Presented at the 4TH London International Carbon and Graphite Conference, London, England, 23--27 September 1974.
K. Koizlik. Oct 74, 67p CONF-7409114-
U.S. Sales Only.

Descriptors: (*Graphite, *Meetings), (*Pyrolytic carbon, Meetings), Deposition, Fast neutrons, Neutron beams, Physical properties, Physical radiation effects, Reactor materials.

For abstract, see NSA 32 03, number 07207.

11C. Coating, Colorants, and Finishes

AD-A013 973/3GA PC$3.75/MF$2.25
Air Force Weapons Lab Kirtland AFB N Mex
Evaluation of Six Paints Subjected to a Nuclear Thermal Environment.
Technical note,
Alfred L. Sharp. Jan 73, 34p Rept no. AFWL-SAA-TN-73-1

Descriptors: *Plastic paints, Thermal radiation, Nuclear explosions, Absorption, Aluminum, Polyurethane resins, Silicone plastics, Computerized simulation, Plastic coatings, Nuclear radiation, Jet bombers.
Identifiers: B-1 aircraft.

An analysis of the relative merit of six B-1 paint candidates has been made for the case where the paints are subjected to the thermal environment produced by detonation of a nuclear weapon. Absorption spectra are used in the TRAP computer program to produce responses for various levels of incident energy. The paints are then ranked as to their suitability.

N75-26138/8GA PC$4.25/MF$2.25
Southern Univ., Baton Rouge, La. Dept. of Mechanical Engineering.
Radiative Property Investigation.
Final Report.
R. L. Scott, Jr.. 1975, 55p NASA-CR-143041
Grant NSG-8016

Descriptors: *Paints, *Reflectance, Monochromators, Photomultiplier tubes, Potassium silicates, Zinc oxides.

For abstract, STAR 1317

N75-26139/6GA PC$3.75/MF$2.25
IIT Research Inst., Chicago, Ill. Technology Center.
Development of Space Stable Thermal Control Coatings for Use on Large Space Vehicles.
Triannual Report, 1 Jan. - 30 Apr. 1975.
Y. Harada, and J. E. Gilligan. Jun 75, 34p NASA-CR-143879, IITRI-C6233-52
Contract NAS8-26791

Descriptors: *Heat shielding, *Spacecraft shielding, *Thermal control coatings, Environment effects, Oxalates, Pigments, Solar reflectors, Titanium compounds, Zinc compounds.

For abstract, STAR 1317

N75-26140/4GA PC$3.25/MF$2.25
Materials Research Labs., Maribyrnong (Australia).
Improved Antifouling by Marine Coatings Containing Mixed Toxics.
L. V. Wake. Jan 75, 19p MRL-TN-363

Descriptors: *Algae, *Marine environments, *Protective coatings, Electron microscopes, Marine technology, Rubber coatings.

For abstract, STAR 1317

PAT-APPL-497 422/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Method for Coating Ferrous Metals with Iron Sulfide by Reaction with Sulfur and Articles Produced Thereby.
Patent Application,
Larry A. Haas. Filed 14 Aug 74, 11p
DOCKET/MIN-2102
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Coating processes, *Iron, *Steel, *Sulfidization, *Patent applications, Sulfur, Iron sulfides.

The patent application concerns a decorative and protective coating on iron or steel articles which is produced by contacting the article in fluid sulfur. Surface reaction of iron and sulfur results in a hard, adherent yellow gold or bronze coating of one of the iron sulfides.

PAT-APPL-589 172/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Preparation of Dielectric Coatings of Variable Dielectric Constant by Plasma Polymerization.
Patent Application.
M. Hudis, and T. Wydeven. Filed 23 Jun 75, 19p
NASA-CASE-ARC-10892-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Deposition, *Dielectrics, *Polymerization, *Protective coatings, *Substrates, *Patent applications, Plasmas (Physics).

A plasma polymerization process for the deposition of a dielectric polymer coating on a substrate is disclosed. The process consists of disposing the substrate in a closed reactor between two temperature controlled electrodes connected to a power supply. A vacuum is maintained within the closed reactor, causing a monomer gas or a gas mixture of a monomer and a diluent to flow into the reactor. A plasma is generated between the electrodes. The dielectric constant of the polymer coating deposited by regulating the gas total and partial pressures, is controlled along with the electric strength and frequency, and the cu current density. A monomer, such as a polar saturated or unsaturated nitrogen-containing compound, or a monomer and diluent, such as a saturated or unsaturated aliphatic hydrocarbon and nitrogen, can by polymerized to form a dielectric coating having a varying dielectric constant in accordance with this plasma polymerization process.

PATENT-3 745 100 Not available NTIS
Department of the Army Washington D C
Method of Preparing Semiporous Film of Aluminum Oxide Voltage Anodization.
Patent,
Howard G. Lasser. Filed 22 Dec 71, patented 10 Jul 73, 4p Rept nos. PAT-APPL-210 909,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Anodic coatings, *Patents, Alumina, Thick films, Aluminum, Preparation.
Identifiers: PAT-CL-204-58.

The patent describes a method of producing a thick film of semiporous aluminum oxide on a sheet of aluminum. Pores are formed by a high voltage anodizing method that includes cooling a low concentrate oxalic acid electrolyte to a temperature of slightly above 0 centigrade and discharging this cooled electrolyte at a high flow rate on the geometric center of the aluminum sheet being anodized. Anodic voltages are initially 150 direct current (D.C.) volts and are increased in 20 volt increments for the first 5 to 10 minutes to the desired voltage for a two hour period with the electrolyte being circulated and cooled at such a rate that its temperature is about 8 centigrade at the end of the two hour period.

PATENT-3 823 019 Not available NTIS
Department of the Interior, Washington, D.C.
Mine Wall Coating.
Patent,
John M. Dale, and Allen C. Ludwig. Filed 6 Sep 72, patented 9 Jul 74, 2p PAT-APPL-286 627,
Supersedes PB-214 085. Also available as report no. DOCKET/MIN-1943.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Construction materials, *Coatings, *Sulfur, Sprayed coatings, Mines, Reinforcing materials, Cyclopentadiene compounds, Glass fibers, Polymerization.
Identifiers: PAT-CL-106-15-FP.

Plasticized sulfur coating compositions have previously been employed for coating walls in order to strengthen or reduce passage of gases and fluids through the walls, as in the construction of concrete block houses. These compositions, however, are expensive, have no fire resistance, have an objectionable odor, are irritating to the eyes, and are difficult to apply with spray equipment, exhibiting a tendency to drip and run. It has now been found, according to the invention, that a composition containing elemental sulfur, dicyclopentadiene, glass fiber and talc provides a totally new material and technique for coating mine walls. The composition of the invention is readily applied to mine walls by spraying, and exhibits good adhesion and greatly improves the strength and imperviousness of the walls. In addition, the composition is fire resistant, has little or no odor and is not irritating to the eyes.

PATENT-3 826 667 Not available NTIS
Department of the Interior, Washington, D.C.
Magnetite Coating Composition.
Patent,

Ernest E. Cohen, and Roland H. Shubert. Filed 30 Nov 72, patented 30 Jul 74, 2p* PAT-APPL-310 721,
Supersedes PB-214 423. Also available as report no. DOCKET/SAL-2097.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Magnetite, *Paints, *Pigments, Printing inks, Coatings, Synthesis(Chemistry), Magnetic materials, Particle size, Preparation, Iron oxides.
Identifiers: PAT-CL-106-259.

This invention relates to improved magnetite coating compositions and to methods for producing the same. More particularly, it relates to a method for producing a magnetic paint or printing ink composition comprising extremely fine particles of magnetite wherein the magnetite is prepared and dispersed in a siccative oil in situ and then thinned to the desired consistency with a solvent. This coating composition is made by reacting an aqueous solution of ferric and ferrous salts with ammonium hydroxide, heating the resulting product to convert it to magnetite, adding a siccative oil to produce a dispersion of magnetite in oil, and adding a solvent thinner.

PATENT-3 827 954 Not available NTIS
Department of the Interior, Washington, D.C.
Electrodeposition of Metallic Boride Coatings.
Patent,
Frank X. McCawley, Charlie Wyche, and David Schlain. Filed 17 Aug 72, patented 6 Aug 74, 4p PAT-APPL-281 353,
Supersedes PB-214 145. Previously filed as PAT-APPL-816 020, 14 Apr 69. Also available as report no. DOCKET/MIN-1651.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electrodeposition, *Titanium boride, *Patents, Anodes, Electric conductors.
Identifiers: PAT-CL-204-39.

According to the patent titanium diboride may be deposited as a coherent, adherent electroplate of controllable thickness on conductive substrate materials. Smooth, consolidated coatings are obtained by electrodeposition from a fused, borate-type bath having dissolved therein at least one titanium compound. Use of a titanium diboride anode, rather than a titanium metal anode, allows increased plating rates, enhances bath stability and decreases bath conditioning time compared to use of a titanium metal anode.

11D. Composite Materials

AD-A013 602/8GA PC$4.25/MF$2.25
United Technologies Research Center East Hartford Conn
Directionally Solidified In-Situ Eutectic Ceramic Matrix-Metal Composites.
Final rept. 15 Feb 74-15 Mar 75,
Charles O. Hulse. 15 Mar 75, 69p Rept no. UTRC/R75-911842-4
Contract N00019-74-C-0271

Descriptors: *Composite materials, *Ceramic materials, High temperature, Heat resistant materials, Superalloys, Aircraft engines, Turbine parts, Whisker composites, Microstructure, Protective coatings, Oxides, Directional, Gas turbines, Heat treatment, Addition reactions, Eutectics, Matrix materials, Solidification.
Identifiers: *Eutectic composites, Metal matrix composites, Whisker composites.

The objective of this work was to identify and develop directionally solidified ceramic matrix-metal eutectic composites for use uncoated at temperatures of 2400 F and preferably higher in aircraft gas turbines. The primary approach was to discover metal-oxygen systems in which the metal whisker phase would form a self-protective oxide coating on exposure to elevated temperatures. Many different metal-oxygen combinations were melted and examined mostly using prefired slugs held in tungsten wire baskets which were heated by radiation inside a carbon susceptor in argon. Practically all compositions could be directionally solidified successfully inside CVD tungsten tubes partially sealed at their ends. Additives which provided additional oxygen to the melt such as CeO2, Cr2O3 and WO3 were often necessary to increase the metal solubility sufficiently to form a eutectic microstructure. A number of potentially interesting systems, Gd2O3-CeO2-Ta, Y2O3-CeO2-Ta, and Y2O3-CeO2-Y, could not survive a 24 hr exposure to air at 2000 F. The Cr-Al2O3, Cr2O3 system, however, showed a surface attack of only a few mils after an exposure of 60 hrs in air at 2600 F. (Author)

AD-A013 609/3GA PC$4.25/MF$2.25
Naval Postgraduate School Monterey Calif
Stress Concentration in Fibrous Composite Material.
Master's Thesis,
Carlos Roberto Santos Alves. Jun 75, 63p

Descriptors: *Fiber reinforced composites, Stress concentration, Theses, Holes(Openings), Parameters, Eccentricity, Sizes(Dimensions), Thinness, Plates, Elastic properties, Finite element analysis, Tensile stress, Strain(Mechanics), Test methods, Fiberglass, Epoxy resins, Distortion.

This thesis work involves an initial study on Stress Concentration caused by holes out of center in thin plates of finite width made of Unidirectional and Crossply Fiberglass Composites. The results are reported under the form of two nondimensional parameters, one representing the eccentricity of the holes, and the other representing the influence of the size of the holes. The graphs plotted for concentration factors permit their use for thin plates of different dimensions. (Author)

AD-A013 884/2GA PC$3.25/MF$2.25
Washington Univ St Louis Mo Materials Research Lab
Failure Criteria to Fracture Mode Analysis of Composite Laminates,
Edward M. Wu. 1975, 13p AFOSR-TR-75-1065
Grant AF-AFOSR-2687-74
Also available as AGARD-CP-163.

Descriptors: *Laminates, *Composite materials, Fracture(Mechanics), Fiber reinforced composites, Glass reinforced plastics, Stresses, Strength(Mechanics), Mathematical models.

Quantitative understanding of the parameters which control composite fracture is imperative to the implementation of fail safe design and inspection of critical load bearing structures. For isotropic materials, fracture is essentially controlled by a single parameter, e.g., the fracture toughness or the stress-intensity factor. This one dimensional nature lends itself to experimental quantification. However, for anisotropic composites there are at least seven primary controlling parameters: (1) crack length; (2) crack orientation with respect to material axis of anisotropy; (3) nature of applied combined stresses; (4) lamination geometry; (5) deformational and strength responses of the constitutent lamina; (6) three kinematically admissible modes of crack extension and (7) crack trajectory. Because of this large number of parameters, experimental quantification by systematic permutation of the parameters must be realistically viewed as intractable. This paper presents an analytical method of reducing these parameters from seven to two and furnishes experimental observations which lend support to the theoretical model.

AD-A014 056/6GA PC$3.75/MF$2.25
Massachusetts Inst of Tech Cambridge Dept of Ocean Engineering
Dynamic Behavior of Ideal Fibre-Reinforced Rigid-Plastic Beams,
Norman Jones. Jun 75, 38p Rept no. OE-75-10
Contract N00014-67-A-0204-0032

Descriptors: *Fiber reinforced composites, *Beams(Structural), *Plastic properties, Dynamic tests, Boundary value problems.

Theoretical solutions are developed herein for the dynamic plastic structural response of some ideal fibre-reinforced beams with boundary conditions and external dynamic loadings which can be reproduced easily and reliably in a laboratory. The theoretical behavior of these beams is also compared to the corresponding dynamic response of rigid perfectly plastic isotropic beams. Generally speaking, it appears that the permanent transverse deflections and response durations of ideal fibre-reinforced beams loaded dynamically are less than the corresponding values for similar rigid perfectly plastic isotropic beams.

N75-26137/0GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Friction and Wear of Carbon-Graphite Materials for High Energy Brakes.
R. C. Bill. Jun 75, 28p NASA-TN-D-8006, E-8259
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Cleveland.

Descriptors: *Aircraft brakes, *Sliding friction, *Wear tests, Boron carbides, Brakes (For arresting motion), Carbon, Graphite, Simulation, Surface layers.

For abstract, STAR 1317

SAND-74-0323 PC$4.25/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Crack Initiation in B-al Composites.
W. R. Hoover. May 75, 23p
Contract AT(29-1)-789

Descriptors: (*Aluminium alloys, Composite materials), (*Boron alloys, Composite materials), (*Composite materials, *Fracture properties), Bending, Cracks, Filaments, Fractures, Strains, Yield strength.

For abstract, see NSA 32 03, number 06959.

11E. Fibers and Textiles

AD-A013 666/3GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Cambridge Center for Materials Science and Engineering
Heterogeneities in Carbon Fibers.
Technical rept.,
S. B. Warner, D. R. Uhlmann, and L. H. Peebles, Jr. 16 Aug 75, 15p Rept no. TR-7
Contract N00014-75-C-0542

Descriptors: *Carbon fibers, *Acrylic resins, Etching, Ion bombardment, Microstructure, Orientation(Direction), Transverse, Stabilization, Crystal substructure, Precursors, Crystal defects, Pyrolysis, Electron microscopy, Spatial distribution, Acrylonitrile polymers, Heterogeneity, Synthetic fibers, Argon.

Acrylic fibers, stabilized acrylic fibers and graphite fibers have been selectively etched by ion

bombardment. After ion etching, the fibers are characterized by structures oriented transverse to the fiber axis with an average spacing ranging from 500-3000 A. These transverse structures are considered to be representative of structural inhomogeneities in the fibers, which are transmitted from the precursor fiber through the stabilization treatment to the final carbon fibers. The relation between these heterogeneities and the standard microstructural models of carbon fibers remains to be elucidated satisfactorily. (Author)

PAT-APPL-509 152/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Formation of Metal Filaments by Solid State Reactions.
Patent Application,
Howard W. Leavenworth, Jr., Beverly W. Dunning, Jr., Robert C. Gabler, Jr., and Carl E. Goldsmith. Filed 25 Sep 74, 13p DOCKET/MIN-2121
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Metal fibers, *Filaments, *Patent applications, Mattes, Copper, Iron, Sulfur, Crystal growth.

The patent application relates to metal filaments grown by solid state reactions from a matrix or matte of copper, iron and sulfur. Copper filaments, iron filaments or copper-iron duplex filaments may be produced by adjustment of temperature and growth conditions. The copper-iron duplex filaments consist of copper at one end and iron at the other with a sharp junction between the two compositions. Individual filaments are typically on the order of 1 micrometer in diameter and the filaments grow in bundles often about 10 micrometers in diameter. Growth is extremely rapid; lengths of 2 to 3 centimeters are attained in a few minutes.

11F. Metallurgy and Metallography

AD-A013 591/3GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
A Fracture Mechanics and Fractographic Study of Fatigue Crack Propagation Resistance in 17-4 PH Stainless Steels.
Final rept.,
T. W. Crooker, D. F. Hasson, and G. R. Yoder. 21 May 75, 22p Rept no. NRL-7910

Descriptors: *Stainless steel, Fracture(Mechanics), Fractography, Electron microscopy, Growth(General), Rates, Modes, Cyclic tests, Heat treatment, Hardening, Test methods, Stresses, Metallography, Crack propagation, Fatigue(Mechanics), Fatigue tests(Mechanics).
Identifiers: Steel 17-4 PH, 17-4 PH steel.

A determination of fatigue-crack propagation resistance in heat-treated samples of 17-4 PH stainless steel has been made, together with correlative microscopic observations via electron fractography. Two rolled plates of 1/2-in. thickness were investigated, one vacuum melted (VM) and heat treated to the H1050 condition and the other argon-oxygen melted (AOM) and heat treated to the H1050 and H1150 conditions. Crack-growth rates (da/dN) were obtained in ambient laboratory air as a function of stress-intensity factor range delta K using single-edge-notched (SEN) tension specimens. The effect of stress ratio R on da/dN was examined; values of R = 0.04, 0.40, 0.67, and 0.80 were employed. Microscopic modes of crack propagation determined by electron fractography were utilized to explain differences in macroscopic crack-growth behavior. Both cleavage and microvoid coalescence can appear as modes of cyclic crack propagation in this family of steels, to the detriment of cyclic crack-growth resistance. When cleavage is present, the amount appears to be independent of delta K over a wide spectrum of delta K levels. Moreover, the incidence of cleavage (and accelerated cyclic crack propagation rates) increases significantly with ratio R. It was found that the heat treatment can be adjusted to minimize the incidence of cleavage, and that slight variation in alloy processing serves to eliminate cleavage and promote striation formation, while enhancing the fracture toughness. (Author)

AD-A013 611/9GA PC$3.75/MF$2.25
American Univ Washington D C Dept of Chemistry
Stress Corrosion Cracking Control Measures. 4. Aluminum Alloys,
B. F. Brown. Jun 75, 39p
Contract N00014-68-A-0245-0007
See also AD-A013 612.

Descriptors: *Stress corrosion, *Aluminum alloys, Fracture(Mechanics), Solutions(Mixtures), Composition(Property), Tensile stress, Corrosion inhibition, Water, Tempering, Anisotropy, Test methods, Assembly, Heat treatment, Quenching, Kinetics, Crystal structure, Cracking(Fracturing).

The most prevalent form of SCC service failures in aluminum alloys is caused by a combination of water, aqueous solutions or atmospheric moisture, alloy of susceptible composition and structure, and sustained tensile stresses, most often caused by heat treatment or assembly. The principal practical measures to control SCC are: (1) select an alloy of minimum susceptibility; (2) for wrought alloy, take precautions not to impose high sustained stresses across the short transverse grain direction unless the alloy and temper confer low susceptibility; (3) keep water and water vapor from the metal surface by providing natural drainage and by painting, with an inhibitor such as chromate; (4) minimize opportunities for chlorides to concentrate; (5) when using a susceptible alloy and temper, compressively stress the metal surface by peening or rolling, followed by painting; (6) use cathodic protection; (7) do not permit mercury or its compounds in close proximity to any aluminum structure.

AD-A013 612/7GA PC$3.25/MF$2.25
American Univ Washington D C Dept of Chemistry
Stress Corrosion Cracking Control Measures. 5. Titanium Alloys,
B. F. Brown. Jun 75, 24p
Contract N00014-68-A-0245-0007
See also AD-A013 611.

Descriptors: *Stress corrosion, *Titanium alloys, Cracking(Fracturing), Environmental tests, Water, Carbinols, Annealing, Nitrogen oxides, Liquid metals, Loads(Forces), Diagnosis(General), Theory, Fracture(Mechanics), Mercury, Tetroxides, Control.

The practical SCC hazards to titanium involve a wide range of environments. For some groups of environments, such as natural waters and nearly neutral aqueous solutions, the cracking occurs only in the presence of a pre-existing crack-like flaw, and fracture mechanics type tests readily characterize the SCC behavior of alloys. Unalloyed titanium and the widely used Ti-6%al-4%V alloy are reasonably resistant to SCC in these environments. For N2O4 and red fuming nitric acid, practical control of the problem is available through controlling the composition of the oxidizers, for which standard specifications are available. For the hot salt cracking problem during heat treatment, meticulous cleanliness of the titanium, backed up preferably by excluding moisture and oxygen from the heat treating atmosphere, serves to control the problem. Though untried in practice, a nickel barrier paint may be useful when contamination at elevated temperatures cannot be avoided in service; the alternative is to design for low operating stresses. For some environments, such as methanol, mercury, cadmium or silver, the strategy is to exclude them from titanium surfaces.

AD-A013 657/2GA PC$4.75/MF$2.25
Naval Postgraduate School Monterey Calif
Characterizing and Controlling the Metallurgical Properties of a Cu-Mn Alloy for Ship Silencing Applications.
Master's thesis,
Frederick Lee Youngblood. Jun 75, 84p

Descriptors: *Alloys, *Ship noise, Reduction, Electrical resistivity, Stresses, Metallurgy, Age hardening, Quenching, Copper alloys, Manganese, Damping, Transformations, Phase studies, Martensite, Kinetics, Hysteresis, Temperature, Models, Predictions.
Identifiers: *Incramute alloy, Copper alloy 2al 40mn.

Electrical resistivity measurements were used to investigate the effect of stress, applied during aging and quenching, on the specific damping capacity (SDC) of Incramute (a 40 Mn - 58 Cu - 2 Al commencial alloy). It was found that (1) stress applied during either aging, or quenching reduces the SDC of the alloy, (2) the martensitic transformation temperature is a linear function of the stress applied during quenching, and (3) stress applied during the aging treatment retards the aging kinetics. The hystersis of the martensite transformation, and the Neel temperature were determined from resistivity-temperature data. A phenomemological model based on SDC, percent of the martensitic transformation, and applied stress was developed to describe and predict the alloy's SDC behavior under various heat treatment schemes and stress conditions. (Author)

AD-A013 826/3GA PC$3.75/MF$2.25
Rock Island Arsenal Ill General Thomas J Rodman Lab
Stress Relieving Procedures for Helical Compression Springs.
Final rept. Feb 72-Dec 73,
Henry P. Swieskowski. May 74, 30p Rept no. RIA-R-TR-74-027

Descriptors: *Springs, *Stress relieving, Manufacturing, Endurance(General), Helixes, Cold working, Time, Crack propagation.

Various stress relieving procedures for the manufacture of cold wound helical compression springs were investigated to determine the effect that the time interval between the coiling and stress relieving operations has on spring life. Production springs with indexes of 3 to 13 were fabricated from various materials. The springs were stress relieved at varying times after the coiling operation. The effect of the time interval between the coiling and stress relieving operations was determined by visual observation for crack initiation and by laboratory endurance tests. Analysis of the test data showed that the time interval between the two operations has no effect on the endurance properties of the materials that were investigated. (Author)

AD-A013 833/9GA PC$4.25/MF$2.25
North Carolina State Univ Raleigh Dept of Materials Engineering
A Mechanistic Model for Prediction of Ductile Erosion.
Final rept. 1 Jan 73-31 Dec 74,
William H. Jennings, Charles R. Manning, Jr., and William J. Head. Jul 75, 69p USAAMRDL-TR-75-30
Contract DAAJ02-73-C-0028

Descriptors: *Alloys, *Erosion resistance, Dust, Sand, Mathematical prediction, Impact shock,

Stainless steel, Aluminum alloys, Titanium alloys, Copper alloys, Beryllium compounds, Electron microscopes, Yield strength, Mathematical models, Helicopter engines, Erosion.

Mechanisms operative in dust erosion of ductile materials were determined with the aid of scanning electron microscope studies. Dimensional analysis was employed in the development of a mathematical model for predicting erosion of ductile materials. The basis of the model was the predominant identified erosion mechanism, target melting. The model was verified in an erosion testing program. Target materials in the testing program were three stainless steels, two aluminum alloys, a beryllium-copper alloy, and a titanium alloy. Erosive agents were three dusts comprised of hard, angular particles and one dust with spherical particles. Maximum particle velocities were 130 or 250 meters per second. (Author)

AD-A013 877/6GA PC$7.00/MF$2.25
Battelle Columbus Labs Ohio
Determination of Selected MIL-HDBK-5 Design Allowable Properties for Five Aerospace Materials.
Annual technical rept. 15 Feb 74-15 Feb 75,
Paul E. Ruff. May 75, 188p AFML-TR-75-58
Contract F33615-73-C-5053
See also report dated May 74, AD-783 616.

Descriptors: *Aluminum alloys, *Steel, *Stainless steel, *Titanium alloys, Compressive properties, Tensile properties, Stress strain relations, Shear strength, Poisson ratio, Vanadium alloys, Tin alloys, Yield strength, Modulus of elasticity, Aircraft.
Identifiers: Aluminum alloy 2024, Steel 17-4PH, Steel 15-5PH, Steel 4Co 9Ni, Titanium alloy 6Al 2Sn 6V.

This annual report describes a test program to develop certain missing MIL-HDBK-5 design allowable properties for five aerospace materials: 2024-T861 aluminum alloy sheet, 17-4PH and 15-5PH precipitation hardening stainless steel bar, 9Ni-4Co-0.20C steel plate, and Ti-6Al-6V-2Sn annealed extrusion. Design allowable properties were determined in accordance with MIL-HDBK-5 guidelines. Mechanical properties determined were Tensile yield strength; tensile ultimate strength; compressive yield strength; shear ultimate strength; bearing yield strength; bearing ultimate strength; compressive modulus of elasticity; Poisson's ratio; stress-strain curves; stress-tangent modulus curves, and high temperature properties.

AD-A013 880/0GA PC$10.25/MF$2.25
Clemson Univ S C Div of Interdisciplinary Studies
Exploratory Development on Oxidation Behavior of Titanium Alloys under High Heating Rates.
Final rept. 1 May 73-31 Oct 74,
James S. Wolf. Apr 75, 392p AFML-TR-74-265
Contract F33615-C-5151, ARPA Order-2387

Descriptors: *Titanium alloys, Oxidation, Heating, Activation energy, Oxygen, Nitrogen, Reaction kinetics, Titanium.
Identifiers: Titanium alloy 6Al 4V, Titanium alloy 8Mn, Titanium alloy 11.5M0 45Sn 6Zr.

The initial stages of reaction of unalloyed titanium, Ti-6Al-4V, Ti8Mn, and beta-III titanium alloy specimens with oxygen, nitrogen and atmospheres bearing these gases has been studied over the temperature range from 800 to 1300C. The kinetics of these reactions were analyzed for specimens subjected to linear heating rates in the range from 0.5 to 100C/s. Mathematical techniques were devised for modeling: (1) the oxygen uptake by unalloyed titanium during heating, and (2) the deposition of the chemical heat of reaction into oxidizing substrates.

AD-A013 895/8GA PC$3.25/MF$2.25
Lehigh Univ Bethlehem Pa Dept of Metallurgy and Materials Science
Strain Energy of (111) Slit Cracks in Cubic Crystals,
H. C. Yang , and Y. T. Chou. 18 Mar 74, 7p
AFOSR-TR-75-1112
Grant AF-AFOSR-2326-72
Availability: Pub. in Materials Science and Engineering, v17 p57-62 1975.

Descriptors: *Metallography, *Crystal defects, Fractography, Crack propagation, Stress strain relations, Energy, Iron, Reprints.
Identifiers: Alpha iron.

Based on the equivalence relations, explicit expressions for the energy of (111) slit cracks in a cubic crystal are obtained. The energy values of (111), (110) and (100) cracks are evaluated and compared for brittle metals and non-metals. The results are used to discuss the cleavage fracture in alpha-iron. (Author)

AD-A013 970/9GA PC$7.00/MF$2.25
Southwest Research Inst San Antonio Tex
A Study of Subcritical Crack Growth in Ship Steels.
Final technical rept.,
P. H. Francis, J. Lankford, Jr., and F. F. Lyle, Jr. Jun 74, 176p Rept no. SwRI-02-3568 SSC-251
Contract N00024-73-C-5199

Descriptors: *Low alloy steels, *Crack propagation, High strength alloys, Ship structural components, Weldments, Fatigue(Mechanics).
Identifiers: High strength steels, Design criteria.

The report presents an evaluation of the potential problems associated with crack initiation and subcritical crack growth in high strength, low alloy steels used in welded ship structure. An interpretive review of the state-of-the-art is given, emphasizing design tools that are available and their potential for use in fail safe or safe crack growth ship design philosophy. A crack initiation and crack growth Criterion is presented, which permits welded ship structure to be designed with confidence that serious failures can be avoided, while at the same time full use of the attractive static properties of HSLA steels can be exploited. The report also includes a list of problem areas in need of further clarification in order to enhance confidence in the proposed Criterion.

AD-A014 010/3GA PC$3.25/MF$2.25
California Univ San Diego La Jolla Dept of Physics
Pressure Dependence of T sub c for the Transition Metals: bcc Solid Solution Alloys in the System Zr-Nb-Mo-Re,
T. F. Smith, and R. N. Shelton. 30 Sep 74, 12p
AFOSR-TR-75-1192
Contract F44620-72-C-0017
Availability: Pub. in Jnl. of Physics, F: Metal Physics, v5 p911-922 May 75.

Descriptors: *Alloys, *Superconductors, *Superconductivity, *Transition temperature, Hydrostatic pressure, Zirconium alloys, Niobium alloys, Molybdenum alloys, Rhenium alloys, Solid solutions, Computations, Reprints.

The variation of the superconducting transition temperature Tc for bcc solid solution alloys in the system Zr-Nb-Mo-Re has been investigated as a function of hydrostatic pressure up to 25kbar. Values of partial Tc over partial P calculated from the theoretical model of Garland and Bennemann are compared with those measured, which are both positive and negative in sign. Quite satisfactory agreement with the overall trend of partial Tc over partial P with composition can be obtained for a reasonable choice of the physical parameters required, though differences in detail are apparent. (Author)

ARL/SM-348 PC$5.25/MF$2.25
Aeronautical Research Labs., Melbourne (Australia).
Fatigue of Steel Structures and Structural Steel.
J. Y. Mann. Mar 74, 42p
U.S. Sales Only.

Descriptors: (*Carbon steels, *Fatigue), (*Stainless steels, Fatigue), (*Steels, Fatigue), Configuration, Cracks, Fracture properties, Mechanical structures, Reviews, Specifications, Welded joints.

For abstract, see NSA 32 03, number 07037.

BNL-19460 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Effect of Surface Roughness on Power Frequency Losses in Superconducting NB sub 3 SN at 4.2 K.
J. F. Bussiere, and M. Suenaga. 1974, 4p CONF-750439-1

Descriptors: (*Niobium alloys, *Superconductivity), (*Tin alloys, Superconductivity), Binary alloy systems, Intermetallic compounds, Losses, Power, Surface properties, Ultralow temperature.

For abstract, see NSA 32 03, number 07038.

CALT-822-67 PC$4.00/MF$2.25
California Inst. of Tech., Pasadena Div. of Engineering.
Studies of Alloy Structures and Properties. Annual Summary Report, 1 December 1973--1 December 1974.
P. Duwez. 1974, 20p
Contract AT(04-3)-822

Descriptors: (*Superconductors, *Research programs), (*Vanadium base alloys, *Superconductivity), (*Palladium base alloys, Superconductivity), (*Silver base alloys, Superconductivity), Amorphous state, Borides, Composite materials, Iron compounds, Nickel base alloys, Phosphides, Quenching, Semiconductor materials.

For abstract, see NSA 32 03, number 07039.

CALT-822-69 PC$4.00/MF$2.25
California Inst. of Tech., Pasadena W.M. Keck Lab. of Engineering Materials.
Enhanced Superconductivity and Lattice Instability in NB--Rh Alloys.
W. L. Johnson, and S. J. Poon. Jan 75, 11p
Contract AT(04-3)-822

Descriptors: (*Niobium alloys, *Superconductivity), (*Rhenium alloys, Superconductivity), Crystal structure, Lattice parameters, Phase transformations, Transition temperature, Ultralow temperature.

For abstract, see NSA 32 03, number 07040.

CALT-822-72 PC$4.75/MF$2.25
California Inst. of Tech., Pasadena W.M. Keck Lab. of Engineering Materials.
Phenomenological Approach to High Transition Temperature Superconducting Alloys.
S. J. Poon, and W. L. Johnson. Apr 75, 37p
Contract AT(04-3)-822

Descriptors: (*Transition element alloys, *Superconductivity), Alloys, Binary alloy systems, Correlations, Melting points, Phase diagrams, Phase transformations, Transition elements, Transition temperature.

For abstract, see NSA 32 03, number 07041.

CONF-740812-8 PC$4.00/MF$2.25
Westinghouse Electric Corp., Madison, Pa.

Observations on the In-Sodium Corrosion and Tribology of Aluminide Coatings on Inconel 718.
G. A. Whitlow, R. L. Miller, W. L. Wilson, and T. A. Galioto. 1974, 19p
Contract AT(11-1)-3045

Descriptors: (*Inconel 718, *Corrosion), (*Aluminium, *Diffusion coating), (*Sodium, *Corrosive effects), Corrosion protection, Diffusion coatings, High temperature, Liquid metals.

For abstract, see NSA 32 03, number 07005.

CONF-741202-20 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Magnetic Susceptibility Measurements on Actinide-Be sub 13 Intermetallic Compounds.
M. B. Brodsky, and R. J. Friddle. 1974, 10p
Contract W-31-109-Eng-38

Descriptors: (*Beryllium base alloys, *Magnetic susceptibility), (*Uranium alloys, Magnetic susceptibility), (*Neptunium alloys, Magnetic susceptibility), (*Plutonium alloys, Magnetic susceptibility), Binary alloy systems, Curie-weiss law, Intermetallic compounds, Low temperature, Medium temperature, Ultralow temperature, Very low temperature, Thorium alloys.

For abstract, see NSA 32 03, number 07043.

CONF-741202-21 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Field-Induced Transitions in Dysb.
T. O. Brun, G. H. Lander, F. W. Korty, and J. S. Kouvel. 1974, 10p
Contract W-31-109-Eng-38

Descriptors: (*Dysprosium alloys, *Phase transformations), (*Antimony alloys, Phase transformations), Antiferromagnetism, Critical field, Electric fields, Ferrimagnetism, Magnetic susceptibility, Neutron diffraction, Paramagnetism, Ultralow temperature.

For abstract, see NSA 32 03, number 07044.

CONF-741202-22 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Role of Itinerant 5F States on the Fermi Surface of TH and Possible Impurity Local Moment Formation.
D. D. Koelling, and A. J. Freeman. 1974, 8p
Contract W-31-109-Eng-38

Descriptors: (*Thorium base alloys, *Fermi level), (*Impurities, *Mobility), De hass-van alphen effect, Electronic structure, Optical properties, Thorium.

For abstract, see NSA 32 03, number 07045.

CONF-741202-23 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Magnetic Properties of Uranium and Plutonium Laves Phases with 3D Transition Elements.
D. J. Lam, and A. T. Aldred. 1974, 7p
Contract W-31-109-Eng-38

Descriptors: (*Transition element alloys, *Magnetic properties), (*Plutonium alloys, Magnetic properties), (*Uranium alloys, Magnetic properties), Binary alloy systems, Cobalt alloys, Intermetallic compounds, Iron alloys, Laves phases, Magnetic fields, Manganese alloys, Moessbauer effect, Nickel alloys, Order parameters, Transition elements.

For abstract, see NSA 32 03, number 07046.

CONF-741202-24 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Magnetic and Lattice Properties of CeBi.
G. H. Lander, M. H. Mueller, and O. Vogt. 1974, 9p
Contract W-31-109-Eng-38

Descriptors: (*Cerium alloys, *Lattice parameters), (*Bismuth alloys, Lattice parameters), Binary alloy systems, Domain structure, Ferromagnetic materials, Free energy, Intermetallic compounds, Magnetic properties, Magnetic susceptibility, Neel temperature, Neutron diffraction, Transition temperature.

For abstract, see NSA 32 03, number 07047.

CONF-741202-25 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Calorimetric Evidence for Localized Spin Fluctuations in UA1 sub 2 .
R. J. Trainor, M. B. Brodsky, and L. L. Isaacs. 1974, 10p
Contract W-31-109-Eng-38

Descriptors: (*Uranium alloys, *Specific heat), (*Aluminium alloys, Specific heat), (*Rhenium alloys, Specific heat), Electric conductivity, Low temperature, Magnetic susceptibility, Medium temperature, Spin, Ultralow temperature, Very low temperature.

For abstract, see NSA 32 03, number 07048.

CONF-750703-3 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Defect--Impurity Interactions in Irradiated Germanium.
J. W. Cleland. 1972, 4p

Descriptors: (*Germanium, *Physical radiation effects), Crystal defects, Crystal doping, Electrons, Impurities, Interstitials, Neutron reactions, Recoils, Semiconductor devices.

For abstract, see NSA 32 03, number 07184.

DP-MS-75-20 PC$4.25/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Blistering and Hydride Embrittlement.
M. R. Louthan, Jr. 1975, 23p CONF-750605-3
Contract AT(07-2)-1

Descriptors: (*Metals, *Embrittlement), (*Hydrogen, *Metallurgical effects), Corrosion, Hydrides, Metallography, Reaction kinetics, Scaling, Stresses.

For abstract, see NSA 32 03, number 07006.

DP-MS-75-21 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Role of Hydrogen in Stress Corrosion Cracking.
M. R. Louthan, Jr. 1975, 17p CONF-750605-4
Contract AT(07-2)-1

Descriptors: (*Metals, *Stress corrosion), (*Alloys, Stress corrosion), (*Hydrogen, *Metallurgical effects), Chemical composition, Coatings, Corrosion protection, Cracks, Embrittlement, Hardness, Microstructure, Steels.

For abstract, see NSA 32 03, number 07007.

DP-MS-75-36 PC$4.50/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Metallurgy of Stress Corrosion Cracking.
J. A. Donovan. 1973, 28p CONF-750605-1
Contract AT(07-2)-1

Descriptors: (*Alloys, *Stress corrosion), (*Metals, Stress corrosion), Cracks, Crystal structure, Dislocations, Grain boundaries, Phase transformations, Point defects, Texture, Vacancies.

For abstract, see NSA 32 03, number 07008.

DP-MS-75-42 PC$5.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Hydrogen Environment Embrittlement.
J. A. Donovan. 1975, 38p CONF-750605-2
Contract AT(07-2)-1

Descriptors: (*Metals, *Embrittlement), (*Hydrogen, *Metallurgical effects), Cracks, Fatigue, Fracture properties, Microstructure, Pressure dependence, Temperature dependence, Yield strength.

For abstract, see NSA 32 03, number 07009.

HEDL-SA-785 PC$4.00/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Swelling in Neutron Irradiated Nickel-Base Alloys.
H. R. Brager, and W. L. Bell. 1972, 3p CONF-750607-2
Contract AT(45-1)-2170

Descriptors: (*Incoloy 800, *Physical radiation effects), (*Hastelloy x, Physical radiation effects), (*Inconel 625, Physical radiation effects), High temperature, Neutron beams, Swelling, Vacancies.

For abstract, see NSA 32 03, number 07186.

IS-M-24 PC$4.00/MF$2.25
Iowa State Univ. of Science and Technology, Ames.
Exchange Interaction in the Heavy Rare-Earth Metals Calculated from Energy Bands.
P. A. Lindgard, and S. H. Liu. 1973, 6p CONF-730821-7

Descriptors: (*Gadolinium, *Exchange interactions), (*Terbium, Exchange interactions), (*Dysprosium, Exchange interactions), (*Erbium, Exchange interactions), Energy levels, Ferromagnetism, Spin waves, Temperature dependence.

For abstract, see NSA 32 03, number 07050.

IS-M-33 PC$4.00/MF$2.25
Ames Lab., Iowa.
Temperature Independent exp 55 Mn Magnetic Hyperfine Fields in Ermn sub 2 and Tmmn sub 2 .
R. G. Barnes, and B. K. Lunde. 1971, 10p CONF-741202-27

Descriptors: (*Erbium alloys, *Nuclear magnetic resonance), (*Manganese alloys, Nuclear magnetic resonance), (*Thulium alloys, Nuclear magnetic resonance), (*Manganese 55, *Hyperfine structure), Curie-weiss law, Knight shift, Laves phases, Neutron diffraction, Temperature dependence.

For abstract, see NSA 32 03, number 07051.

KAPL-P-4022 PC$4.00/MF$2.25
Knolls Atomic Power Lab., Schenectady, N.Y.
Effect of Radiation on the Deformation and Fracture of Structural Alloys.
C. E. Lacy. Mar 75, 20p CONF-750442-1
Contract W-31-109-ENG-52

Descriptors: (*Copper alloys, *Physical radiation effects), (*Gold alloys, Physical radiation effects), (*Inconel alloys, Physical radiation effects), (*Nimonic, Physical radiation effects), Binary alloy systems, Creep, Fatigue, Intermetallic compounds, Reactor materials, Reactor ves-

sels, Reviews, Stainless steels, Steel-astm-a533-b.

For abstract, see NSA 32 03, number 07187.

LA-5943-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
One-Dimensional Calculations of Shock-Loaded Polycrystalline Beryllium.
R. E. Swanson. Apr 75, 9p
Contract W-7405-eng-36

Descriptors: (*Beryllium, *Impact shock), Anisotropy, Computer calculations, Elasticity, Polycrystals, Response functions, S codes, Shock waves, Stresses, Velocity.

For abstract, see NSA 32 03, number 07053.

LBL-3742 PC$4.25/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Auger Electron Spectroscopy of Alloy Surfaces.
S. H. Overbury, and G. A. Somorjai. Mar 75, 25p
CONF-750702-1
Contract W-7405-ENG-48

Descriptors: (*Silver alloys, *Surface properties), (*Gold alloys, Surface properties), (*Lead alloys, Surface properties), (*Indium alloys, Surface properties), Auger effect, Chemical composition, Homogeneous mixtures, Temperature dependence.

For abstract, see NSA 32 03, number 07054.

N75-26093/5GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Friction and Wear of Tin and Tin Alloys from Minus 100 C to 150 C.
D. H. Buckley. Jun 75, 13p NASA-TN-D-8004, E-8230

Descriptors: *Sliding friction, *Tin, *Tin alloys, *Wear tests, Aluminum alloys, Bismuth alloys, Coefficient of friction, Copper alloys, Crystal lattices, Temperature effects.

For abstract, STAR 1317

N75-26094/3GA PC$3.75/MF$2.25
IIT Research Inst., Chicago, Ill. Metals Research Div.
Thermal Fatigue and Oxidation Data on Taz-8A, Mar-M 200, and Udimet 700 Superalloys.
M. A. H. Howes. 15 Jan 75, 41p NASA-CR-134775, IITRI-B6124-21
Contract NAS3-17787

Descriptors: *Heat resistant alloys, *Oxidation, *Thermal fatigue, Crack propagation, Fluidized bed processors, Thermal cycling tests.

For abstract, STAR 1317

N75-26096/8GA PC$5.75/MF$2.25
Ohio State Univ. Research Foundation, Columbus. Dept. of Metallurgical Engineering.
Effect of Hydrogen on the Mechanical Properties of Titanium and Its Alloys.
Final Report, Jan. 1972 - Jun. 1975.
F. H. Beck. Jun 75, 145p NASA-CR-134796
Contract NGL-36-008-051

Descriptors: *Hydrogen embrittlement, *Mechanical properties, *Titanium, *Titanium alloys, Hydrides, Plastic properties, Single crystals, Strain rate, Stress corrosion cracking, Twinning.

For abstract, STAR 1317

N75-26419/2GA PC$3.75/MF$2.25
Oxford Univ. (England). Dept. of Engineering Science.
On Fitting Yield and Plastic Potential Functions to Experimental Results.
B. Dodd, and D. A. Scivier. Nov 74, 27p OUEL-1111/74

Descriptors: *Metals, *Plastic properties, *Potential theory, *Stress-strain diagrams, Strain rate, Yield strength.

For abstract, STAR 1317

N75-26890/4GA PC$3.25/MF$2.25
Cornell Univ., Ithaca, N.Y. Lab. of Atomic and Solid State Physics.
Aluminum under High Pressure. 1: Equation of State.
C. Friedli, and N. W. Ashcroft. May 75, 23p
NASA-CR-143081
Contract NGR-33-010-189

Descriptors: *Aluminum, *Equations of state, *High pressure, *Single crystals, Crystal structure, Electron-ion recombination, Face centered cubic lattices, Fermi surfaces, Numerical analysis.

For abstract, STAR 1317

N75-26891/2GA PC$5.25/MF$2.25
Eidgenossische Technische Hochschule, Zurich (Switzerland).
Concerning the Influence of Diffusion on the Electro-Crystallization of Metals.
Ph.D. Thesis.
M. Braun. 1973, 116p REPT-5015
Language in German.

Descriptors: *Crystallization, *Electrochemistry, *Electrodeposition, *Metals, Copper, Electrodes, Surface layers, Surface roughness, Transport properties.

For abstract, STAR 1317

PAT-APPL-498 333/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Use of Scavenger in Recovery of Metal Values.
Patent Application,
Filed 18 Aug 74, 18p DOCKET/MIN-2250
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Air pollution, *Metal industry, *Patent applications, *Sulfur dioxide, Sulfide minerals, Mineral deposits, Copper ores, Iron ores, Nickel ores, Smelting, Extractive metallurgy, Calcium oxides.
Identifiers: *Air pollution control.

In the patent application sulfide ores are reduced to metallic values such as nickel, copper and iron, by use of a scavenger such as calcium oxide to combine with the sulfur and prevent sulfurous gas from escaping into the atmosphere. The separate metals, copper, nickel and iron can then be recovered as by leaching.

PAT-APPL-500 797/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Charging an Electric Furnace.
Patent Application,
Jack E. Tress, and Willard L. Hunter. Filed 26 Aug 74, 12p DOCKET/MIN-2049
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Electric furnaces, *Charging, *Feeders, *Patent applications, Metallurgical furnaces, Continuous furnaces.

The patent application relates to a metallic charge introduced into an electric furnace in a continuous fashion using as a feeding device an unobstructed tubular container of undulant or zig-zag shape. The feeding device is oriented horizontally and is rotated about its longitudinal axis causing the charge to advance through the container and discharge into the furnace through a roof port. The feeding device can handle a variety of material sizes and shapes, ranging from powder to shredded scrap, singly or in admixture, without modification. Hot furnace gases are vented through the feeding device thus cooling the gases and preheating the furnace charge.

PAT-APPL-503 536/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Preparation of Alloys.
Patent Application,
Ronald A. Guidotti. Filed 5 Sep 74, 5p
DOCKET/MIN-2228
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Tantalum alloys, *Niobium alloys, *Vanadium alloys, *Patent applications, *Alloying, Compacting, Heating, Melting, Nitrides, Tantalum nitrides, Tantalum containing alloys, Niobium containing alloys, Vanadium containing alloys, Nickel containing alloys, Cobalt containing alloys, Iron containing alloys, Niobium inorganic compounds, Vanadium inorganic compounds, Nickel alloys, Cobalt alloys, Iron alloys.

The patent application relates to alloys of tantalum, niobium and vanadium prepared by a process comprising (1) admixing Ta, Nb or V nitride with an alloying metal, such as Ni, Co or Fe; (2) compacting the admixture and (3) heating the compact under vacuum at a temperature above the liquidus temperature of the desired alloy.

PAT-APPL-504 464/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Extraction of Metal Values from Ores.
Patent Application,
Howard W. Leavenworth, Jr., Earl B. Amey, Beverly W. Dunning, Jr., Robert C. Gabler, Jr., and Carl E. Goldsmith. Filed 11 Sep 74, 15p
DOCKET/MIN-2210
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Extractive metallurgy, *Patent applications, Nickel, Cobalt, Manganese, Chromium, Iron, Fluidized bed processors, Leaching, Pyrometallurgy, Chlorination.
Identifiers: PAT-CL-204-105.

The patent application describes a method for the extraction of metal values from laterite ores including nickel, chromium, manganese, iron and cobalt by a series of steps. This includes chlorinating the ore in a fluidized bed with hydrogen chloride gas to form volatile metal chlorides of nickel, iron, cobalt and manganese, and a residue containing chromium, removing and condensing the volatile chlorides to effect separation, recovering the metals of nickel, cobalt and manganese and chlorine as by the use of electrolytic cells, reacting the iron chloride with oxygen to separate the iron as iron oxide; removing the residue from the fluid bed reactor for reduction with carbon to produce carbides; leaching to form salts of chromium, separating from other salts, and

recovering the chromium. Also provided is a continuous method for practice of the process.

PAT-APPL-559 942/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Hydrometallurgical Process for Copper Recovery from Sulfide Ores.
Patent Application,
Philip R. Haskett, Carl H. Elges, III, Donald J. Bauer, and Roald E. Lindstrom. Filed 19 Mar 75, 7p DOCKET/MIN-1936
Also available as DOCKET/MIN-2428.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Hydrometallurgy, *Copper, *Patent applications, Extractive metallurgy, Leaching, Copper ores, Sulfide minerals, Potassium carbonates, Sodium hydroxide, Chalcopyrite, Oxidation.

The patent application relates to recovery of copper from sulfide ores achieved by placing the ore together with a caustic soda or potash solution in a pressure vessel. An oxidizing gas is then introduced into the vessel and the temperature and pressure of the system is adjusted as required. Copper ions are freed from the crystalline structure in the form of the complex anion, Cu(OH)(-4). The copper may then be recovered by reduction or precipitation as cupric oxide.

PAT-APPL-584 094/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
A Zirconium Modified Nickel-Copper Alloy.
Patent Application.
J. D. Whittenberger. Filed 5 Jun 75, 12p NASA-CASE-LEW-12245-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Catalytic activity, *Copper alloys, *Internal combustion engines, *Nickel alloys, *Reactor materials, High temperature, Mechanical properties, *Patent applications, Zirconium.

An improved material for use in a catalytic reactor is reported. The material reduces nitrogen oxide from internal combustion engines and is in the form of a zirconium modified, precipitation strengthened nickel-copper alloy. This material has a nominal composition of Ni-30 Cu-0.2 Zr and is characterized by improved high temperature mechanical properties.

PATENT-3 825 651 Not available NTIS
Department of the Interior, Washington, D.C.
Recovery of Gold from Ores.
Patent,
Harold J. Heinen, Judith A. Eisele, and Dennis D. Fischer. Filed 14 Oct 71, patented 23 Jul 74, 2p PAT-APPL-189 198,
Also available as report no. DOCKET/MIN-1604.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Extractive metallurgy, *Gold, *Patents, Pyrometallurgy, Reducing agents, Iron, Iron sulfides, Pyrite, Aluminum inorganic compounds, Sulfides, Gallium inorganic compounds, Sulfur, Iron chlorides, Chlorination.
Identifiers: PAT-CL-423-44.

The patent relates to gold recovered from its ores by treating the ores at elevated temperature with gaseous chlorine in the presence of metallic iron, a sulfide of iron, aluminum sulfide or gallium sulfide to form a volatile complex of the formula AuMeCl6, where Me is iron, aluminum or gallium.

PATENT-3 826 808 Not available NTIS
Department of the Interior, Washington, D.C.
Process for Recovering Tungsten from Alkaline Brine.
Patent,
Ivan I. Nichols, and Raymond O. Dannenberg.
Filed 2 Aug 73, patented 30 Jul 74, 2p PAT-APPL-385 214,
Supersedes PB-255 014. Also available as report no. DOCKET/MIN-2059.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Tungsten, *Patents, Extraction, Brines, Alkalinity, Pyrocatechols, Quarternary ammonium salts, Extractive metallurgy.
Identifiers: PAT-CL-423-54.

In the patent, tungstate ion in alkaline brine is complexed with a dihydroxy phenolic compound prior to extraction with an organic solvent or a resin. The alkaline brines containing tungsten in the form of tungstate are conventionally formed by digestion of tungsten ores or concentrates with strong caustic.

PB-243 628/5GA PC$3.75/MF$2.25
Bureau of Mines, Rolla, Mo. Rolla Metallurgy Research Center.
Converting Stainless Steel Furnace Flue Dusts and Wastes to a Recyclable Alloy.
Rept. of investigations,
H. E. Powell, W. M. Dressel, and R. L. Crosby. Jun 75, 30p BuMines-RI-8039

Descriptors: *Stainless steels, *Steel making, *Flue dust, *Materials recovery, Chromium, Molybdenum, Zinc, Lead, Nickel, Reclamation, Metal scrap, Manganese, Solid waste disposal, Extraction, Iron and steel industry.
Identifiers: *Waste recycling, Metal recycling.

Over 5 million pounds of nickel, and 90 thousand pounds of molybdenum are lost annually in the dusts generated in the production of stainless steels. Losses of these metals in the form of mill scale and grinding swarfs may be double the dust losses. This report describes a process for recovering these and other metals in the form of an alloy steel suitable for recycling. Zinc and lead, when present in the wastes, are recovered as byproducts in the form of oxide fumes. The laboratory scale process (10-to 25-pound charges) recovers up to 95 pct of the chromium, 100 pct of the nickel, and 100 pct of the iron as an alloy containing from 10 to 20 pct chromium, 6 to 12 pct nickel, and 55 to 65 pct iron together with lesser amounts of molybdenum and manganese, and essentially free of zinc, lead, and sulfur. The zinc-lead fume contains about 40 pct zinc and 20 pct lead and represents essentially all of these metals contained in the wastes.

PB-243 671/5GA PC$3.25/MF$2.25
British Steel Corp., Sheffield (England). Information Services.
Hydrogen Sampling in Electroslag Refining.
C. C. Jackson. Jun 75, 8p CDL/ESD/2/75

Descriptors: *Electrorefining, *Metallurgical analysis, *Sampling, *Hydrogen, Steels, Steel making, Slags, Liquid metals, Great Britain.

A method of liquid metal sampling for hydrogen during the ESR process has been developed. Radiographic examination indicates that this technique yields solid, high density samples. Hot extraction gas analysis shows that reproducible results are obtained.

PB-243 682/2GA PC$3.75/MF$2.25
Bureau of Mines, College Park, Md. College Park Metallurgy Research Center.
Evaluation of Steel Made with Ferrous Fractions from Urban Refuse.
Rept. of investigations 1975,
H. V. Makar, R. S. Kaplan, and L. Janowski. Jun 75, 32p BuMines-RI-8037

Descriptors: *Steel making, *Metal scrap, Solid waste disposal, Reclamation, Refuse disposal, Mechanical properties, Corrosion tests, Tensile properties, Impact strength, Hardness.
Identifiers: *Waste recycling, *Metal recycling.

A two-part study was conducted to determine problems associated with the use of ferrous fractions from urban refuse as melting stock for steelmaking and to evaluate the resulting steel products. The first part of the study involved 50lb ingots from laboratory melts, and the second part included 50- and 800-lb ingots from 1-ton-electric-arc-furnace melts. The 50-lb ingots from the laboratory melts and the arc furnace melts were hot rolled to provide material for mechanical and corrosion testing. Most steels rolled successfully and exhibited acceptable surface and edge condition; tensile strengths of the plain carbon steels were not significantly affected by copper, up to concentrations of 0.65 percent, and were not affected by tin contents; impact strength decreased with increasing tin content, and hardness increased slightly with increasing copper content; in general, properties of the steel produced were not measurably affected by charge composition (that is, melting stock), melting practice, or method of scrap preparation.

RD/B/N-3236 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Fatigue Behaviour of Annealed AISI 316 Stainless Steel in Air and High Temperature Sodium: Review and Preliminary Results.
P. Marshall. Nov 74, 19p
U.S. Sales Only.

Descriptors: (*Stainless steel-316, *Fatigue), (*Sodium, *Corrosive effects), Air, Cracks, Oxygen.

For abstract, see NSA 32 03, number 07057.

RD/B/N-3284 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Measurement of Void Swelling by Transmission Electron Microscopy.
S. B. Fisher, and J. T. Buswell. Jan 74, 13p
U.S. Sales Only.

Descriptors: (*Stainless steels, Swelling), (*Nickel base alloys, Swelling), (*Swelling, *Electron microscopy), Density, Physical radiation effects, Transmission, Voids, Volume.

For abstract, see NSA 32 03, number 07189.

SAND-74-0190 PC$5.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Calorimetric Determination of Energy Deposition by Electrons in Tantalum and Layered Media.
G. H. Miller, and G. J. Lockwood. Sep 74, 40p
Contract AT(29-1)-789

Descriptors: (*Tantalum, *Physical radiation effects), (*Aluminium, Physical radiation effects), Calorimeters, Calorimetry, Emissivity, Energy transfer, Foils, Radiant heat transfer.

For abstract, see NSA 32 03, number 07190.

SAND-75-6006 PC$4.75/MF$2.25
Surface Treatment of Zirconium Alloys by Molten Oxidizing Salts.
C. Hardy-Grena, A. Avogadro, and J. G. Wurm. Apr 75, 32p
Translation of EUR--3476.f.

Descriptors: (*Zirconium, *Corrosion protection), (*Hydrogen, *Corrosive effects), (*Terphenyls, Corrosive effects), (*Organic chlorine compounds, Corrosive effects), Chemical reactions, Corrosion resistance, Molten salts, Oxidation, Sodium nitrates, Surface treatments.

For abstract, see NSA 32 03, number 07011.

SAND-75-8502 PC$4.25/MF$2.25
CEA Centre d'Etudes de Bruyeres-le-Chatel, 92 - Montrouge (France).
Tritium Diffusivity and Solubility Measurements in Z 5 Nctd 26-15 (A 286) Austenitic Stainless Steel.
R. Broudeur, J. P. Fidelle, J. Devaux, and M. Rapin. Jan 75, 22p CONF-720571-1
Translation by Patricia Newman of Mesures de diffusivite et de solubilite du tritium dans un acier inoxydable austenique Z 5 NCTD 26-15.

Descriptors: (*Tritium, *Solubility), (*Alloy-a-286, *Solvent properties), Diffusion, High temperature, Medium pressure.

For abstract, see NSA 32 03, number 07059.

TID/SNA-2124 PC$4.00/MF$2.25
General Dynamics Corp., Fort Worth, Tex. Convair Aerospace Div.
Flexure Fatigue Tests of Ti-5A1-2.5SN at -423 exp 0 F.
N. R. Adsit. Jul 71, 14p

Descriptors: (*Titanium base alloys, *Fatigue), (*Aluminium alloys, Fatigue), (*Tin alloys, Fatigue), Cryogenics, Nerva reactor, S-n diagram, Testing, Very low temperature.

For abstract, see NSA 32 03, number 07064.

UH-235P12X1 PC$4.00/MF$2.25
USAEC San Francisco Operations Office, Calif.
Pressure Derivatives of Elastic Moduli in BCC Transition Metals and Their Solid Solutions. Progress Report for the First Year, 1 June 1974--20 April 1975.
1975, 11p

Descriptors: (*Niobium alloys, *Elasticity), (*Molybdenum alloys, Elasticity), (*Molybdenum, Elasticity), (*Niobium, Elasticity), Bcc lattices, Binary alloy systems, Density, Monocrystals, Pressure dependence, Solid solutions, Tantalum.

For abstract, see NSA 32 03, number 07066.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-A013 720/8GA PC$3.25/MF$2.25
Aerospace Corp El Segundo Calif Chemistry and Physics Lab
Nylasint Pore System: Reservoir or Sink.
Interim rept.,
Leon M. Dormant, and Seymour Feuerstein. 29 Jul 75, 25p Rept no. TR-0076(6270-30)-2
SAMSO-TR-75-205
Contract F04701-75-C-0076

Descriptors: *Lubrication, Bearings, Spacecraft components, Space environments, Reservoirs, Porous materials, Nylon, Equilibrium(General), Lubricants, Replenishment, Capillaries, Communication satellites.

Porous nylon blocks are currently used as lubricant replenishment reservoirs in moving mechanical assemblies within communication satellites and other spacecraft that must have long mission lifetimes. This report presents theoretical and experimental evidence that the reservoir function is not fulfilled under isothermal conditions because of capillary effects.

11I. Plastics

N75-26142/0GA PC$6.25/MF$2.25
Institut fuer Festkoerpermechanik, Freiburg (West Germany).
Investigations on the Fracture Process in Polymethyl Methacrylate of Different Molecular Weight.
W. Doell. Aug 74, 161p WB-4/74
In German; English Summary.

Descriptors: *Crack initiation, *Crack propagation, *Fracture mechanics, *Molecular weight, *Polymethyl methacrylate, Branching (Physics), Fractography, Load distribution (Forces), Strain energy methods.

For abstract, STAR 1317

11K. Solvents, Cleaners, and Abrasives

PATENT-3 154 497 Not available NTIS
Department of the Army Washington D C
Method of Improving the Storage Properties of Alkaline Detergent Compositions.
Patent,
Abraham Mankowich. Filed 21 Mar 62, patented 27 Oct 64, 2p Rept nos. PAT-APPL-181 490,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Detergents, Storage.
Identifiers: PAT-CL-252-135, *Caking.

The caking of powder detergent compositions in storage, with consequent loss of free flowing and granular characteristics, has been a serious problem of the cleaning compound manufacturers. The primary object of this invention, is, therefore, the development of a process for improving the storage properties of detergent compositions by eliminating the caking thereof. A typical detergent composition in which the present invention could be employed would consist of sodium metasilicate pentahydrate as the alkaline detergent salt which simultaneously serves as the inhibitor of corrosion of aluminum, sodium tripolyphosphate as the principal detergent builder and water softener, sodium primary phosphate present for the purpose of reducing the pH of aqueous solutions, and a liquid nonionic (100 percent active content) surfactant of the alkyl aryl polyethylene glycol ether type.

PATENT-3 179 597 Not available NTIS
Department of the Army Washington D C
Vertical Adherence Paint Remover Compositions.
Patent,
Abraham Mankowich. Filed 7 Nov 61, patented 20 Apr 65, 2p Rept nos. PAT-APPL-150 844,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Paint removers, Formulations, Gels, Fatty acid esters.
Identifiers: PAT-CL-252-125.

Conventional alkaline-organic solvent, vertical adherence paint removers have two disadvantages; namely, lack of storage stability and rapid evaporation of the organic solvent component after application of said remover to the surfaces which are to be stripped of paint. These disadvantages are traceable to two commonly used ingredients of such products. This invention deals with compositions of matter which form thickened, alkaline-organic solvent, vertical adherence paint removers. It deals more particularly with thickened brush-on and spray-on paint removers for use on ferrous surfaces comprising highly alkaline detergents, surfactant soaps of fatty and rosin acids, glycols, metallic soap thickeners and water. These materials are combined into stable, mucilaginous, thixotropic gels.

PB-243 839/8GA PC$12.50/MF$2.25
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC Advertising Substantiation Program-Antiperspirant Manufacturers. The Gillette Company.
10 Aug 73, 550p FTC-732-3133-G2

Descriptors: *Truth in advertising, *Manufacturers, *Toilet preparations, Publicity, Consumer relations, Formulations, Effectiveness, Aluminum hydroxides, Aluminum halides.
Identifiers: Gillette Company, Right Guard's Natural Scent, Powdered Soft and Dri, *Antiperspirants, Aluminum chloride hydroxide.

Documentation is submitted in support of various claims concerning the effectiveness of Right Guard's Natural Scent spray antiperspirant in the prevention of wetness; that Natural Scent's scent is solely derived from ingredients found freely in nature, that it smells light, clear, and not perfumey or chemical; and that Powdered Soft and Dri (1) is completely dry when it makes contact with the user's skin; (2) is effective as an antiperspirant; (3) doesn't cause stinging of the skin because it is lightly powdered, even when used right after shaving.

PB-244 316/6GA PC$7.50/MF$2.25
Federal Trade Commission, Washington, D.C. Bureau of Consumer Protection.
FTC Advertising Substantiation Program-Antiperspirant Manufacturers. Documentation of Sterling Drug Inc.
3 Aug 73, 235p FTC-732-3133-SD

Descriptors: *Truth in advertising, *Manufacturers, *Toilet preparations, Publicity, Consumer relations, Formulations, Efficiency, Aluminum hydroxides, Aluminum halides.
Identifiers: *Antiperspirants, Sterling Drug Incorporated, Body All, Aluminum chloride hydroxide.

Documentation is submitted in support of various claims concerning Body All antiperspirant: (1) that Body All deodorant operates on a principle that no other deodorant has ever worked on before; (2) that Body All is activated only by and in direct proportion to the amount of perspiration expended by a person; (3) that in the normal usage of Body All, after repeated occurrences of perspiration, there will always remain an adequate quantity of deodorant to prevent an odor from forming on the area sprayed; (4) that Body All has been tested and proved an effective antiperspirant; (5) that Body All is perceived to be gentle by all users on the delicate areas of their skin; and (6) that Body All acts as an effective antiperspirant as well as a deodorant because it contains powder.

11L. Wood and Paper Products

PAT-APPL-587 923/GA PC$3.25/MF$2.25
Department of Agriculture, Washington, D.C.
Treatment of Wood with Butylene Oxide.
Patent Application,
Roger M. Rowell, and David I. Gutzmer. Filed 18 Jun 75, 11p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Wood preservatives, *Fungus proofing, Epoxy compounds, Pine wood, Treatment.
Identifiers: PAT-CL-252-407, Butene oxides.

The patent application relates to the chemical treatment of cellulosic materials. More particularly, the invention relates to the treatment of wood and its derivative materials to obtain increased resistance to rot while improving dimensional stability. The reaction of cellulosic materials with butylene oxide under mildly alkaline conditions increases resistance to fungi while improving dimensional stability. Wood is first dried and then submerged in a treating chamber containing a solution of butylene oxide and triethylamine. The chamber is heated and subjected to pressure, after which time the solution is drained and vacuum is applied to remove remaining excess reagent.

PAT-APPL-588 099/GA PC$3.25/MF$2.25
Department of Agriculture, Washington, D.C.
Low Density Fiberboard and Method of Making the Same.
Patent Application,
Gary G. Meyers. Filed 18 Jun 75, 7p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Fiberboards, Density(Mass/volume), Phenolic resins, Manufacturing.
Identifiers: PAT-CL-156-62-2.

The patent application relates generally to the field of wood fiberboard. More particularly it is concerned with a low-density board product of wood fiber and phenolic resin and a method of making same. A wet-formed low density-board product is made primarily from wood fiber and phenolic resin. A mixture of powdered saponin, powdered phenolic resin and methylcellulose solution is whipped into a thick foam. Moistened wood fiber is added and the blending process continued for approximately one minute. The foamed resin-fiber mixture is poured into a pan and dried in an oven to remove the moisture. The dried mat is then placed in a hot press to cure the resin.

PB-242 973/6GA PC$3.25/MF$2.25
North Central Forest Experiment Station, St. Paul, Minn.
How Craftsmen and Home Hobbyists Can Make and Use Wood Plastic Composite Materials.
Forest service general technical rept. (Final),
Howard N. Rosen. Jan 74, 13p* FSGTR-NC-10

Descriptors: *Wood based composites, *Plastics, *Handicrafts, Gluing, Woodworking, Impregnating, Wood processing industry, Curing, Equipment, Wood finishing, Safety, Machining, Workshops, Efficiency.
Identifiers: Hobbyists.

A technique for producing craft items of wood-plastic composites in the home, school, or small shop is described. Suggestions are given on how to build the treating equipment for under $30. Wood impregnation, processing techniques, gluing, finishing, and safety are discussed. The ease and versatility of producing crafts from wood-plastic composites are demonstrated by example projects.

PB-243 527/9GA PC$3.25/MF$2.25
Svenska Traforskningsinstitutet, Stockholm.
The Tensile Strength of Redwood Perpendicular to the Grain and Its Dependence on Moisture Content and Temperature,
Hans Carlsson, and Bertil Thunell. 1975, 7p
Meddelande-327, TT-42

Descriptors: *Structural timber, *Tensile strength, *Redwood, Drying, Moisture content, Temperature, Cracks, Shrinkage, Wood processing industry, Stresses, Cell morphology, Wood grain, Sweden.

The cracks which can occur in timber during drying, due to the stresses caused by shrinkage, are initiated when the stresses exceed the ultimate strength. It is therefore important to know whether the ultimate strength changes during the drying process in such a way that, for instance, more sensitive intervals are passed. The tangential strength which is the most critical steadily increases as the moisture content drops, while the radial strength is more irregular. The spread is larger at low values of the moisture content in the case of the tangential strength, due to the presence of internal stresses, while the spread in the radial direction is large over the whole range, since the properties of the individual annual rings exert a greater influence in this case.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-A013 604/4GA PC$3.75/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Maximal Order of Multipoint Iterations Using n Evaluations.
Interim rept.,
H. Wozniakowski. Jul 75, 35p
Contract N00014-67-A-0314-0010, Grant NSF-GJ-32111

Descriptors: *Iterations, *Scalar functions, *Nonlinear systems, *Operators(Mathematics), Interpolation, Matrices(Mathematics), Hypotheses.
Identifiers: Hermite-Birkoff interpolation, Kung and Kraub conjecture.

This paper deals with multipoint iterations without memory for the solution of the nonlinear scalar equation f(m) (x) = 0, m > or = p sub n(m) be the maximal order of iterations which use n evaluations of the function or its derivatives per stop. We prove the Kung and Traub conjecture p sub n(m) (0) = 2(n-1) for Hermitian information. We show p sub n(m + 1) > or = p sub n(m) and conjecture p sub n(m) = 2(n-1). The problem of the maximal order is connected with Birkhoff interpolation. Under a certain assumption we prove that the Polya conditions are necessary for maximal order.

AD-A013 683/8GA PC$5.75/MF$2.25
Aerospace Research Labs Wright-Patterson AFB Ohio
A Topological Analysis Research and Demonstration Computer Program Library.
Final rept. 1 Aug 72-1 Aug 74,
Kenneth O. Leland. Jun 75, 141p Rept no. ARL-75-0155

Descriptors: *Topology, *Computer programming, Mapping(Transformations), Complex numbers, Logarithm functions, Computations, Subroutines, FORTRAN.

This report describes a computer program designed to operate in either batch mode or interactive conversational mode, created for the purposes of demonstrating certain aspects of the foundations of complex function theory and of facilitating research therein. The program is built around the concept of winding number which it relates to the concept of integer valued analogue of the complex analytic logarithm function. This number counts the number of times a closed path in the plane 'winds' about a point. It can be expressed in terms of concepts of combinatorial topology or analytically in terms of complex contour integrals or complex logarithm functions. A detailed set of instructions on how to use the program as well as a listing of the program coding is included.

AD-A013 688/7GA PC$3.25/MF$2.25
Technology Inc Dayton Ohio
Linear Invariant Prediction of Order Statistics in Location and Scale Families.
Interim rept. 20 May-16 Aug 74,
Kenneth S. Kaminsky, Nancy R. Mann, and Paul I. Nelson. Jun 75, 19p ARL-75-0151
Contract F33615-73-C-4155

Descriptors: *Sampling, *Normal density functions, Invariance, Reliability.
Identifiers: *Order statistics, Exponential density functions, Logistic density functions, Chi square density functions.

Identical items are simultaneously subjected to stress and operate independently until failure. The authors observe the early failures and use the times of these failure to predict the times of later failures in the same sample. Best linear invariant predictors are derived for location-scale families of failure time distributions, and two simplified predictors are developed. The relative behavior of the predictors is indicated in a table.

AD-A013 708/3GA PC$3.25/MF$2.25
Kent State Univ Ohio Dept of Administrative Sciences
A Linear Programming Solution to the Generalized Rectangular Distance Weber Problem,
James G. Morris. 1974, 11p
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p155-164 Mar 75.

Descriptors: *Linear programming, Facilities, Transportation, Costs, Space(Room), Variables, Constrictions, Reprints.
Identifiers: Weber problem.

The Weber Problem generalized to the location of several new points with respect to existing points is formulated as a linear programming problem under the assumption that distances are rectangular. The dual problem is then formulated and subsequently reduced to a problem with substantially fewer variables and constraints than required by an existent alternative linear programming formulation. Flows may exist between new as well as between new and existing points. Linear constraints can be imposed to restrict the location of new points. Pairwise constraints limiting distances between new points and between new and existing points can also be accommodated. (Author)

AD-A013 710/9GA PC$3.25/MF$2.25
Cornell Univ Ithaca N Y Center for Environmental Quality Management
Optimal Replacement under Additive Damage and Other Failure Models,
Howard M. Taylor. 1974, 19p
Grant NSF-GK-21460
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p1-17 Mar 75.

Descriptors: *Replacement theory, *Failure, *Damage, Costs, Models, Random variables, Optimization, Reprints.

A machine or production system is subject to random failure. Upon failure the system is replaced by a new one, and the process repeats. A cost is associated with each replacement, and an additional cost is incurred at each failure in service. Thus, there is an incentive for a controller to attempt to replace before failure occurs. The problem is to find an optimal control strategy that balances the cost of replacement with the cost of failure and results in a minimum total long-run average cost per unit time. We attack this problem under the cumulative damage model for system failure. In this failure model, shocks occur to the system in accordance with a Poisson process. Each shock causes a random amount of damage or wear and these damages accumulate additively. At any given shock, the system fails with a known probability that depends on the total damage

accumulated to date. We assume that the cumulative damage is observable by the controller and that his decisions may be based on its current value. Supposing that the shock failure probability is an increasing function of the cumulative damage, we show that an optimal policy is to replace either upon failure or when this damage first exceeds a critical control level, and we give an equation which implicitly defines the optimal control level in terms of the cost and other system parameters. Also treated are some more general models that allow for income lost during repair time and other extensions. (Author)

AD-A013 711/7GA PC$3.25/MF$2.25
Arizona Health Planning Authority Phoenix
A Mean Cost Approximation for Transportation Problems with Stochastic Demand,
Dan Wilson. 1974, 8p
Availability: Pub. in Naval Logistics Quarterly, v22 n1 p181-187 Mar 75.

Descriptors: *Stochastic processes, *Operations research, *Cost analysis, Transportation, Approximation(Mathematics), Models, Algorithms, Costs, Boundaries, Reprints.

Among the many tools of the operations researcher is the transportation algorithm which has been used to solve a variety of problems ranging from shipping plans to plant location. An important variation of the basic transportation problem is the transportation problem with stochastic demand or stochastic supply. This paper presents a simple approximation technique which may be used as a starting solution for algorithms that determine exact solutions. The paper indicates that the approximation technique offered here is superior to a starting solution obtained by substituting expected demand for the random variables. (Author)

AD-A013 762/0GA PC$3.25/MF$2.25
Hawaii Univ Honolulu Dept of Information and Computer Science
Estimation of Spatial Wavenumber Spectra and Falloff Rate with Unequally Spaced Observations,
Richard H. Jones. 5 Feb 74, 12p AFOSR-TR-75-1107
Grant AF-AFOSR-2405-72
Availability: Pub. in Jnl. of the Atmospheric Sciences, v32 n2 p260-268 Feb 75.

Descriptors: *Spatial distribution, *Meteorology, *Wave analyzers, Wave functions, Mathematical models, Atmospheric motion, Turbulence, Spectrum analyzers, Reprints.

A maximum likelihood estimation procedure is developed for estimating the spatial wavenumber spectrum and falloff slope for a stationary process on a circle when multiple realizations are available at the same unequally spaced locations.

AD-A013 805/7GA PC$3.25/MF$2.25
Colorado Univ Boulder Dept of Mathematics
Analysis of Convergence and Truncation Error of Expansions of Functions of Aerospace Physics and Engineering.
Final rept. 1 Jun 70-30 May 75,
Wolfgang J. Thron, and William B. Jones. 1 Aug 75, 16p AFOSR-TR-75-1175
Grant AF-AFOSR-1888-70

Descriptors: *Truncation, *Approximation, *Continued fractions, Special functions(Mathematical), Convergence, Errors.
Identifiers: Pade approximants, *Truncation errors.

This research deals mainly with convergence, speed of convergence, and truncation error estimation of Pade approximants and continued fractions and of the application of these and other known results to expansions of functions of aerospace physics and engineering. It is also concerned with the development of algorithms and computational techniques to aid in the practical application of the methods. The research problems and results involve the general areas of numerical and computational analysis, approximation methods, applied complex analysis, special functions, and the analytic theory of Pade approximants and continued fractions.

AD-A013 809/9GA PC$3.25/MF$2.25
California Univ San Diego La Jolla Dept of Applied Mechanics and Engineering Sciences
Adaptive Optimal Input Synthesis for Linear System Identification.
Interim rept.,
B. R. Upadhyaya, and H. W. Sorenson. 1975, 8p AFOSR-TR-75-1093
Grant AF-AFOSR-1809-69

Descriptors: *Control theory, Linear systems, Statistical analysis.
Identifiers: Parameter estimation.

Optimal open-loop feedback formulation of the input synthesis problem for parameter estimation in linear dynamic systems is presented. The combination of recursive estimation and synthesis technique features a marked improvement in the behavior of estimates over the open-loop formulation. These methods are also applied in designing probing signals when the discrete a priori distribution of the parameters is known.

AD-A013 844/6GA PC$3.25/MF$2.25
Rice Univ Houston Tex Dept of Mechanical Engineering
New Techniques in Numerical Analysis and Their Application to Aerospace Systems.
Final rept. 1 Sep 74-31 Aug 75,
Angelo Miele. 1975, 22p AFOSR-TR-75-1176
Grant AF-AFOSR-2185-72

Descriptors: *Control theory, *Numerical analysis, Algorithms, Computer applications, Nonlinear algebraic equations, Nonlinear differential equations, Numerical integration, Mathematical programming, Computations.
Identifiers: IBM 370/155 computers.

The objective of this investigation is to contribute to numerical techniques of interest in systems theory in general and aerospace engineering in particular. Typical areas of mathematical research are: (a) solution of nonlinear, algebraic or transcendental, equations, (b) solution of nonlinear, ordinary differential equations, (c) mathematical programming problems, and (d) optimal control problems. Typical areas of application are: (1) numerical solution of optimum flight trajectories and (2) numerical solution of optimum aerodynamic shapes. Algorithms for digital computer have been developed and tested on IBM 370/155.

AD-A013 859/4GA PC$4.25/MF$2.25
California Univ Irvine Systems Engineering and Operations Research Group
Minimum Variance Controls-Configured Systems.
Doctoral thesis,
Roger F. Roberts. May 75, 68p Rept no. SEOR-75-2 AFOSR-TR-75-1051
Grant AF-AFOSR-2116-71

Descriptors: *Control theory, *Mathematical programming, Linear systems, Stochastic processes, Feedback, White noise, Computations, Algorithms, Automatic pilots, Theses.
Identifiers: Time invariant systems.

The problem of optimal regulation for stochastic linear systems is examined and posed as a mathematical programming problem. The approach taken is that of simultaneously configuring both the plant and controller, thereby producing what is called a controls-configured system. A computational procedure, built around the Generalized Reduced Gradient algorithm, is developed using the state convariance as the measure of system regulation, hence yielding a minimum variance, controls-configured system design. Two examples are presented that illustrate the procedure in which regulation is improved by approximately 18% over that achievable with a fixed plant. The stabilization of a linear time-invariant system is examined using state variable feedback. A mathematical programming algorithm is presented which permits the selection of a feedback gain matrix that yields, subject to a prescribed constraint set, a stable closed-loop solution. The technique is applied to a sample problem and appears well-suited for the stabilization problem.

AD-A013 871/9GA PC$3.25/MF$2.25
Wisconsin Univ Madison Dept of Statistics
Statistical Models for Time Series and Life Testing with Application in Engineering Systems.
Annual rept. 1 Jun 74-31 Mar 75,
G. E. P. Box, John Gurland, G. K. Bhattacharyya, Richard A. Johnson, and Grace Wahba. 1975, 12p AFOSR-TR-75-1190
Grant AF-AFOSR-2363-72

Descriptors: *Time series analysis, *Reliability, *Control theory, Life tests, Stochastic processes, Feedback.
Identifiers: Feedback control.

The paper presents results on the continuing interest in system reliability and life testing and in stochastic systems with applications in closed loop control, forecasting, model building, smoothing and curve estimation. Also included in this period was a study on the extent of distortion on statistical inferences caused by violation of assumptions. Considerable progress has been made on the topic of estimation of stochastic and dynamic parameters from data collected for a system under feedback control.

AD-A013 872/7GA PC$3.25/MF$2.25
North Carolina Univ Chapel Hill Dept of Statistics
Automata in Environments: III. Random Environments.
Doctoral thesis,
Jerren Gould. 1975, 24p AFOSR-TR-75-1191
Grant AF-AFOSR-2840-75

Descriptors: *Automata, *Statistical analysis, Stochastic processes, Measure theory, Random variables, Theorems.
Identifiers: *Automata theory, Finite state machines, Probabilistic automata.

This paper considers the case of automata operating within random environments. This formulation of automata in random environments is useful when only certain probabilistic assumptions about the occurrence of any environment configuration can be made or when the environment configuration can only be measured by statistical techniques.

AD-A013 873/5GA PC$3.25/MF$2.25
North Carolina Univ Chapel Hill Dept of Statistics
On the Rate Distortion Function of a Memoryless Gaussian Vector Source Whose Components Have Fixed Variances,
Hoi M. Leung, and Stamatis Cambanis. 1971, 21p AFOSR-TR-75-1104
Grant AF-AFOSR-2796-75

Descriptors: *Analysis of variance, *Inequalities, Matrices(Mathematics), Vector spaces, Theorems, Covariance.
Identifiers: *Rate distortion functions, Eigenvalues.

Consider a memoryless Gaussian vector source and assume that the variances of the components of its i.i.d. vectors are known and that no further information on their covariance structure is available. The authors study the dependence of the rate distortion function of such a source on the covariance structure of its i.i.d. vectors. In particular the authors give upper and lower bounds of the rate distortion function, both expressed only in terms of the known variances, and they show that the lower bound is tighter than the Shannon lower bound over a certain distortion region.

AD-A013 874/3GA PC$4.25/MF$2.25
California Univ Irvine Systems Engineering and Operations Research Group
Linear Multivariable Servomechanisms.
Technical rept.,
C. A. Wolfe. May 75, 73p Rept no. SEOR-75-3 AFOSR-TR-75-1050
Grants AF-AFOSR-2116-71, NSF-GK-39735

Descriptors: *Control theory, *Servomechanisms, Linear systems, Transfer functions, Matrices(Mathematics), Theorems, Theses.
Identifiers: Multivariable feedback control.

The object of this dissertation is the study of linear multivariable servomechanisms. The main thrust of the research is to extend the single-input/single-output concept of 'system type' to the multivariable (multi-input/multi-output) case. For the multivariable system, system type is given as a vector of numbers which represent the type of the individual input/output pairs. New methods are presented for determining the type of a multivariable transfer function both from the frequency domain and from the time domain descriptions of the system. The problem of designing compensators to create a transfer function of a specified type is considered.

AD-A013 883/4GA PC$3.25/MF$2.25
Minnesota Univ Minneapolis Center for Control Sciences
Quadratic Theory and Feedback Controllers for Linear Time Delay Systems.
Interim rept.,
E. B. Lee. 1974, 12p AFOSR-TR-75-1115
Grant AF-AFOSR-2243-72
Pub. in Proceedings of the 1974 Autumn Mathematical Course on Control Theory and Topics in Functional Analysis, Trieste, Italy.

Descriptors: *Control theory, Linear systems, Feedback, Functional analysis, Theorems, Time lag theory.
Identifiers: Feedback control.

This lecture is devoted to a discussion of recent researches on the design of controllers for systems having time delays. Results for the 'open loop' and 'closed loop' designs are presented. In both cases results for minimizing a quadratic cost functional are given. The usefulness of these results is not known, but similar results for the nondelay case are being routinely applied.

AD-A013 888/3GA PC$3.25/MF$2.25
Indiana Univ Bloomington Dept of Mathematics
Asymptotic Distribution of Rank Statistics for Experiments Involving Incomplete Block Designs,
Madan L. Puri, and Norman L. Wykoff. 21 Feb 72, 27p AFOSR-TR-75-1228
Grant AF-AFOSR-2009-71
Availability: Pub. in Annals of the Inst. of Statistical Mathematics, v26 n3 p421-446 1974.

Descriptors: *Statistics, Asymptotic series, Random variables, Theorems, Matrices(Mathematics), Ratings, Distribution functions, Reprints.
Identifiers: *Block design.

AD-A013 892/5GA PC$3.25/MF$2.25
Minnesota Univ Minneapolis Center for Control Sciences
Stability of Linear Multivariable Feedback Systems with Time Lags,
E. B. Lee. 1974, 15p AFOSR-TR-75-1116
Grant AF-AFOSR-2243-72
Availability: Pub. in Proceedings of the Autumn Mathematical Course on Control Theory and Topics in Functional Analysis, 1974, Trieste (Italy).

Descriptors: *Control theory, *Feedback, *Time lag theory, Linear systems, Stability, Transfer functions, Functional analysis, Reprints.
Identifiers: Multivariable systems, Time delay systems, Feedback controllers.

The design of stabilizing feedback controllers for linear multivariable systems with time delays is considered. First it is shown that if the system is characterized by a transfer function which is the ratio of exponential polynomials, then there is a standard state space realization by a linear differential-difference equation. The main stability result relates a function of the system transfer function to the location of the zeros of the characteristic function. The application to feedback controller design is illustrated by an example. (Author)

AD-A013 896/6GA PC$3.25/MF$2.25
Yeshiva Univ New York Dept of Physics
Equilibrium States for Classical Systems,
C. Gruber, and J. L. Lebowitz. 18 Jul 74, 9p AFOSR-TR-75-1196
Grant AF-AFOSR-2430-73
Availability: Pub. in Communications in Mathematical Physics, 41 p11-18 1975.

Descriptors: *Equations, *Correlation techniques, *Equilibrium(General), *Functions(Mathematics), Markov processes, Reprints.
Identifiers: *Equilibrium states.

It is shown that the Dobrushin-Lanford-Ruelle equations for the probability measure mu, and the Kirkwood-Salsburg type equations for the lattice or continuum correlation functions rho, and for the spin correlation functions sigma, are essentially equivalent for all rho, sigma and mu satisfying certain boundedness conditions. It is also noted that the lattice equations are identical to the equations for the stationary states of a certain Markoff process. This extends previous results of Ruelle, Brascamp and Holley who proved some of these equivalences for states. (Author)

AD-A013 899/0GA PC$3.25/MF$2.25
Indiana Univ Bloomington Dept of Mathematics
Asymptotic Results for Rank Statistics in some Multivariate Problems,
Madan L. Puri. 1973, 11p AFOSR-TR-75-1227
Grant AF-AFOSR-2009-71
Availability: Pub. in Bulletin of the International Statistical Inst. Proceedings of session (39th), Vienna (Austria), 1973, p285-294.

Descriptors: *Statistics, *Multivariate analysis, Asymptotic series, Sampling, Vector analysis, Parameters, Confidence limits, Reprints.

In this paper we give a brief description of a class of procedures based on the ranks of the observations for some multivariate two-sample location problems. Specifically, we consider the problems of testing, estimation, and confidence regions for the vector of location parameters. (Author)

AD-A013 903/0GA PC$3.25/MF$2.25
California Univ Los Angeles Dept of Engineering Systems
Optimal Observers for Continuous Time Linear Stochastic Systems,
C. T. Leondes, and John F. Yocum, Jr. 7 Feb 74, 15p AFOSR-TR-75-1218
Grant AF-AFOSR-2166-72
Availability: Pub. in Automatica, v11 p61-73 1975.

Descriptors: *Stochastic processes, *Control theory, *Feedback, *Linear systems, Differential equations, Algorithms, Optimization, White noise, Kalman filtering, Least squares method, Analysis of variance, Determinants(Mathematics), Markov processes, Reprints.
Identifiers: *Observer filters.

Observers may be designed, for linear dynamic stochastic systems, with lower dimensions and simpler construction than optimal estimators, but their least-square optimal performance diminishes as the dimensions decrease. (Author)

AD-A013 909/7GA PC$3.75/MF$2.25
Brown Univ Providence R I Div of Applied Mathematics
Discrete Approximations for Stochastic Control Problems with Control Acting Continuously and Impulsively.
Interim rept.,
Harold J. Kushner. 1975, 45p AFOSR-TR-75-1049
Grants AFOSR-2078-71, NSF-ENG73-03846
Prepared in cooperation with Office of Naval Research, Arlington, Va.

Descriptors: *Control theory, Stochastic processes, Markov processes, Convex sets, Theorems.
Identifiers: *Stochastic control, Markov chains.

Stochastic control problems of either the optimal stopping or impulsive control type on diffusion models are considered, but there is also a continuously acting control. Various computationally convenient Markov chain approximations to the problems are developed, and it is shown that the costs for the sequence of approximations converge to the optimal cost for original problems.

AD-A013 910/5GA PC$3.75/MF$2.25
Brown Univ Providence R I Div of Applied Mathematics
Identification of Linear Differential Systems on a Finite Time Interval Without Estimating the Initial State.
Interim rept.,
A. E. Pearson. 1975, 26p AFOSR-TR-75-1048
Grants AFOSR-2078-71, NSF-ENG73-03846

Descriptors: *Control theory, Linear systems, Matrices(Mathematics), Linear algebraic equations, Differential equations, Transfer functions, Theorems.
Identifiers: Parameter estimation, Multivariable feedback control.

Linear algebraic equations are derived for identifying the parameters of a linear multivariable differential system based on input-output data observed noise-free over a finite time interval. The technique circumvents the need for estimating the initial state of the system. The formulation allows for unknown input disturbances to the extent that such disturbances can be modeled by the free response of a linear differential equation. It is shown that a unique solution is obtained only if the component functions of the input-output data, together with a certain number of their derivatives, are linearly independent on the observation interval.

AD-A013 953/5GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Quantization Errors in the Fast Fourier Transform.
Journal article,
David V. James. 2 Feb 74, 8p Rept no. JA-4375 ESD-TR-75-195
Contract F19628-73-C-0002, ARPA Order-2006
Availability: Pub. in IEEE Transactions on Acoustics, Speech, and Signal Processing, vASSP-23 n3 P277-283 Jun 75.

Descriptors: *Fourier transformation, Coefficients, Arithmetic, Errors, Quantization, Reprints.
Identifiers: *Fast Fourier transforms, Floatings point arithmetic.

When a fast Fourier transform (FFT) is implemented on a digital machine, quantization errors will arise due to finite word lengths in the digital system. The magnitudes and characteristics of these errors must be known if an FFT is to be designed with the minumum word lengths needed for acceptable performance. Two forms of FFT quantization, coefficient rounding and floating point arithmetic quantization, are analyzed in this paper. A theory is presented from which several new results can be obtained. The error characteristics of FFT's using exact and truncated values for the coefficients 1 and -j are found to be roughly equivalent. The accuracy of the theory is tested by computer simulations. Using the models introduced in this paper, new and accurate models can be derived to model quantization errors in high-speed convolution filters. (Author)

AD-A014 014/5GA PC$3.25/MF$2.25
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
Solution of Two-Dimensional Boundary Value Problems by Arbitrary Grid Finite Difference Methods,
Paul S. Jensen. 1974, 6p AFOSR-TR-75-1165
Contract F44620-71-C-0109
Availability: Pub. in AICA, p80-85 1975.

Descriptors: *Finite difference theory, *Numerical analysis, *Partial differential equations, *Boundary value problems, Set theory, Ellipses, Grids, Computer applications, Flat plate models, Computer programs, Reprints.

There are a variety of numerical methods in current use for solving elliptic partial differential equations on modern computers. Classification of these methods in terms of the forms of node sets N and meshes M used is discussed. A class N method, which involves the node set only is studied. This involves the construction of finite difference expressions on an arbitrary node set (grid)which is subject to the fundamental finite differencing problem of neighbor selection called the 'bad neighbor problem.' An effective solution to this problem is presented. Numerical results for a plate problem are presented and compared with results from other analysis programs.

AD-A014 015/2GA PC$3.25/MF$2.25
Honeywell Inc Minneapolis Minn Systems and Research Div
Boundary Value Control of the Wave Equation in a Spherical Region,
Keith D. Graham, and David L. Russell. 24 May 73, 23p AFOSR-TR-75-1117
Contract F44620-72-C-0044
Availability: Pub. in SIAM Jnl. of Control, v13 n1 p174-196 Jan 75.

Descriptors: *Boundary value problems, *Wave equations, *Control theory, Spheres.

AD-A014 036/8GA PC$3.25/MF$2.25
California Univ Los Angeles Dept of Biomathematics
Contamination Probability of Order Statistics.
Final rept. 29 Jun 73-31 Dec 74,
V. K. Murthy. 15 Aug 75, 24p
Contract N00014-69-A-0200-4049

Descriptors: *Sampling, *Normal density functions, Analysis of variance, Mean, Nonparametric statistics, Random variables, Theorems.
Identifiers: *Order statistics.

Given that an arbitrary number of observations are contaminated, explicity expressions are obtained for the probability of the ith smallest observation in the sample to be the jth smallest contaminated one. The probabilities are tabulated for the cases up to three contaminating observations for samples from a normal distribution with either scalar or location contamination. It is also shown that for large samples the corresponding normal approximation for the multinomial may be used for approximating the contaminating probabilities.

AD-A014 058/2GA PC$3.25/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
A Class of Optimal-Order Zero-Finding Methods Using Derivative Evaluations.
Interim rept.,
Richard P. Brent. Jun 75, 17p
Contract N00014-67-A-0314-0010, Grant NSF-GJ-32111
Prepared in cooperation with Australian National Univ., Canberra. Computer Centre.

Descriptors: *Functions(Mathematics), Iterations, Approximation, Differential equations, Runge kutta method, Theorems.
Identifiers: *Zero finding, Roots of equations.

It is often necessary to find an approximation to a simple zero zeta of a function f , using evaluations of f and f' . In this paper the author considers some methods which are efficient if f' is easier to evaluate than f . Examples of such functions are given.

AD-A014 059/0GA PC$3.75/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Multiple-Precision Zero-Finding Methods and the Complexity of Elementary Function Evaluation.
Interim rept.,
Richard P. Brent. Jul 75, 28p
Contract N00014-67-A-0314-0010, Grant NSF-GJ-32111
Prepared in cooperation with Australian National Univ., Canberra. Computer Centre.

Descriptors: *Functions(Mathematics), Interpolation, Approximation, Theorems.
Identifiers: *Zero finding, Floating point operation, Turing machines, Roots of equations.

The author considers methods for finding high-precision approximations to simple zeros of smooth functions. As an application, the author gives fast methods for evaluating the elementary functions log(x), exp(x), sin(x) etc. to high precision. For example, if x is a positive floating-point number with an n-bit fraction, then (under rather weak assumptions) an n-bit approximation to log(x) or exp(x) may be computed in time asymptotically equal to 13M(n) log of n to the base 2 as n approaches infinity, where M(n) is the time required to multiply floating-point numbers with n-bit fractions. Similar results are given for the other elementary functions, and some analogies with operations on formal power series are mentioned.

AD-A014 060/8GA PC$3.75/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Symposium on Analytic Computational Complexity Program and Abstracts, Held at Carnegie-Mellon University, Pittsburgh, Pennsylvania on April 7-8, 1975.
Interim rept.,
J. F. Traub. 8 Apr 75, 30p
Contract N00014-67-A-0314-0010, Grant NSF-GJ-32111

Descriptors: *Computer applications, *Computations, *Meetings, Algebra, Numerical analysis, Algorithms.
Identifiers: *Computational complexity.

This is the program and abstracts of invited and contributed papers presented at a Symposium on Analytic Computational Complexity on April 7-8. The full texts of the invited papers and abstracts of the contributed papers will be published in the Proceedings by Academic Press in Fall, 1975.

AD-A014 062/4GA PC$6.25/MF$2.25
Cornell Univ Ithaca N Y Dept of Operations Research
On Minimax Multistage Permanent Elimination Type Rules for Selecting the Largest Normal Mean.
Technical rept.,
Ajit C. Tamhane. May 75, 173p Rept no. TR-259
Contracts DAHC04-73-C-0008, N00014-67-A-0077-0020

Descriptors: *Sampling, *Normal density functions, Analysis of variance, Monte Carlo method, Bayes theorem, Minimax technique, Optimization, Theorems.
Identifiers: Ranking, Indifference zones.

The problem of selecting the population associated with the largest mean from k > or = 2 normal populations is considered in the context of the indifference-zone approach.

AD-A014 076/4GA PC$4.25/MF$2.25
Naval Research Lab Washington D C
A Fortran Program for Rapid Computations Involving the Non-Central, Chi-Square Distribution.
Final rept.,
Howard L. Wiener. Aug 75, 60p Rept no. NRL-MR-3106

Descriptors: *Statistical tests, *Computer programs, Computations, FORTRAN, Degrees of freedom, Ocean surveillance.
Identifiers: Chi square density functions, CDC 3800 computers, LAMBDA computer program, NOVA 800 computers, Chi square test.

A computer program has been developed for rapidly computing the non-centrality parameter in a statistical test of the chi-square distribution against a non-central chi-square alternative, when the number of degrees of freedom, the level of significance, and the power are all specified. The program produces results similar to those in previously published tables but operates with a marked saving in execution time. The program is well suited to implementation as part of a larger program, as part of a man-computer interactive system, or within a minicomputer. The report contains a program listing together with tables of computed values of the noncentrality.

N75-25960/6GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Recursive Identification and Tracking of Parameters for Linear and Nonlinear Multivariable Systems.
M. Sidar. May 75, 39p NASA-TM-X-62446, A-6115

Descriptors: *Identifying, *Multivariate statistical analysis, *Recursive functions, *Tracking (Position), Aircraft stability, Algorithms, Covariance, Iterative solution, Maximum likelihood estimates.

For abstract, STAR 1317

N75-26668/4GA PC$3.75/MF$2.25
Forschungsinstitut fuer Anthropotechnik, Meckenheim (West Germany).
Optimization of Control Signal Gain by Self-Adjustment die Optimierung der Bediensignalverstaerkung durch Selbsteinstellung.
W. Kruse, and G. Rotbauer. Mar 74, 49p FB-13
In German; English Summary.

Descriptors: *Amplification, *Man machine systems, *Optimal control, *Pursuit tracking, Control simulation, Control sticks, Operators (Personnel).

For abstract, STAR 1317

N75-26742/7GA PC$3.25/MF$2.25
Houston Univ., Tex. Dept. of Mathematics.
Householder Transformations and Optimal Linear Combinations.
H. P. Decell, Jr., and W. Smiley, III. Jun 74, 14p
NASA-CR-141879, REPT-38
Contract NAS9-12777

Descriptors: *Linear systems, *Theorem proving, *Transformations (Mathematics), Group theory, Matrices (Mathematics), Orthogonal functions, Topology.

For abstract, STAR 1317

N75-26744/3GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Riemann'S Method in the Inverse Problem of Scattering Theory, Part 2.
H. I. Gugushvili, and Y. L. Mentkovskiy. Jun 75, 10p NASA-TT-F-16428-PT-2, ITF-70-76-P
Contract NASW-2481
Tran-Transl. into English from Russian Preprint Rept. Itf-70-76-p, 1970 10 p.

Descriptors: *Cauchy problem, *Riemann waves, *Wave scattering, Angular momentum, Coulomb potential, Functions (Mathematics), Molecular energy levels, S waves.

For abstract, STAR 1317

N75-26777/3GA PC$4.75/MF$2.25
Gesellschaft fuer Mathematik und Datenverarbeitung, Bonn (West Germany).
Subgroups of Specially Presented Groups Untergruppen Speziell Praesentierter Gruppen.
J. Ackva. 1974, 88p BMFT-GMD-93
Subm-Sponsored in Part by Bundesmin. Fuer Forsch. U. Technol. And Landesamt fuer Forsch. Des Landes Nordrhein-Westfalen.
Language in German.

Descriptors: *Degrees of freedom, *Group theory, *Subdivisions, Combinatorial analysis, Problem solving, Relationships, Set theory, Theorem proving.

For abstract, STAR 1317

PB-243 912/3GA PC$3.25/MF$2.25
Rutgers - The State Univ., New Brunswick, N.J. Dept. of Computer Science.
Quantitative Error Analysis of Numerical Methods for Partial Differential Equations,
R. Vichnevetsky, K. W. Tu, and J. A. Steen. Mar 74, 8p DCS-TR-28 W75-10003, OWRT-B-045-NJ(2)
Proceedings of the Annual Princeton Conference on Information Science and Systems (8th), Princeton, Mar 74.

Descriptors: *Partial differential equations, *Numerical analysis, Approximation, Transfer functions, Error analysis, Estuaries.

The principle of independence for small numerical errors is used to analyze global errors for certain classes of partial differential equations which arise in quality analysis for estuarial systems.

12B. Operations Research

AD-A013 581/4GA PC$3.25/MF$2.25
Stanford Univ Calif Systems Optimization Lab
Specially Structured Mathematical Programming Problems.
Interim rept. 1 Jun 74-31 May 75,
16 Jul 75, 8p AFOSR-TR-75-1149
Contract F44620-74-C-0079

Descriptors: *Mathematical programming, Budgets, Integer programming, Quadratic programming, Uncertainty.

The major results concern the solution of multistage capital budgeting problems complicated by incomplete information by uncertainty, and by other factors, with emphasis on making it possible to explicitly consider probable future alternative projects, and the solution of certain classes of large-scale convex quadratic programming problems related to variational inequalities.

AD-A013 639/0GA PC$3.75/MF$2.25
Massachusetts Inst of Tech Cambridge Operations Research Center
Vehicle Routing Problems: Formulations and Heuristic Solution Techniques.
Technical rept.,
Bruce L. Golden. Aug 75, 32p Rept no. TR-113
Contract N00014-75-C-0556

Descriptors: *Vehicles, *Routing, Allocations, Integer programming, Allocations, Network flows, Optimization.
Identifiers: Combinatorial programming, Traveling salesman problem.

An essential element of the newspaper logistics system is the allocation and routing of vehicles for the purpose of delivering newspapers on a daily basis. In this paper, the author presents various vehicle routing problems. Formulations defining the mathematical models are discussed in conjunction with several widely-used heuristic solution techniques. The focus is on providing a unified framework for these very difficult combinatorial programming problems.

AD-A013 975/8GA PC$3.75/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Management Sciences Research Group
Some Structure and Basis Theorems for Integral Monoids.
Research rept.,
Robert G. Jeroslow. Jul 75, 35p Rept no. RR-367
Contract N00014-67-A-0314-0007, Grant NSF-GP-37510

Descriptors: *Integer programming, Matrices(Mathematics), Inequalities, Convex sets, Theorems, Monoids.
Identifiers: Cutting plane method, *Integral monoids.

The author considers sets of integer vectors containing the zero vector and closed under addition, the integral monoids, and provides conditions under which they contain a finite subset of integer vectors which generate the entire monoid as non-negative integer combinations. It is also shown that integral monoids, which have a finite subset of the type just described, can be represented as the sum of a group and a monoid whose convex span is a pointed cone. The paper concludes with some applications to the theory of integer programming.

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-A013 633/3GA PC$5.25/MF$2.25
Varo Inc Garland Tex Texas Div
Searchlight Set, AN/VSS-4 (XE-2) (Turret Integrated Xenon Illuminator).
Final technical rept.,
L. Hodge. Jul 75, 106p Rept no. TD-6-19-75
Contract DAAK02-74-C-0222

Descriptors: *Searchlights, Xenon lamps, Tank turrets, Tanks(Combat vehicles).
Identifiers: AN/VSS-4(XE-2), M-60A1tanks, M-60 tanks.

The report describes the design of the AN/VSS-4 (XE-2) Searchlight, formerly called the Turret Integrated Xenon Illuminator (TIXI). This system consists of a power supply unit, a servo amplifier unit, an optical unit and a control box unit. The system is designed to mount in the left port of the M60A1 tank turret vacated by the coincidence rangefinder.

AD-A013 735/6GA PC$5.75/MF$2.25
Shaker Research Corp Ballston Lake N Y
Reliability Model for Miniature Blowers Per MIL-B-23071B.
Final rept. Feb 74-Mar 75,
Donald S. Wilson, and John W. Wilkinson. Jul 75, 128p RADC-TR-75-178
Contract F30602-74-C-0131

Descriptors: *Blowers, Miniature electrical equipment, Reliability, Mathematical models, Ball bearings, Life expectancy, Electronic equipment, Lubrication, Electrical insulation, Regression analysis, Fans.
Identifiers: Mean time to failure.

A statistical review of life test failure data of over 2000 electronic cooling fans and blowers covered by MIL-B-23071B was conducted. The approach followed and the results obtained are discussed. A mathematical reliability model was established for the prediction of blower life as a result of the analysis. A procedure is presented for predicting the mean time to failure and failure rate of miniature fans and blowers.

AD-A014 070/7GA PC$4.75/MF$2.25
Little (Arthur D) Inc Cambridge Mass
Investigation of Scroll Fluid Machinery for Cryogenic Helium Refrigerators.
Final rept. 1 Jun 73-31 Dec 73,
Raymond W. Moore, Jr. Feb 75, 96p Rept no. ADL-C-75976
Contract N00014-73-C-0451

Descriptors: *Refrigeration systems, Refrigerant compressors, Refrigerant condensers, Cryogenics, Marine propulsion, Superconductivity, Liquid helium, Friction, Wear, Self lubrication.

The objective of the program was to investigate the applicability of scroll fluid machinery (compressors and expenders) to cryogenic helium refrigerators or liquefiers for superconductive ship propulsion systems. Thermodynamic cycles for appropriate refrigerator/liquefier systems have been analyzed; and, based on the results of this analysis, typical performance characteristics for a scroll compressor and a scroll expander suitable for these systems have been defined. Design requirements for the scroll compressor, a 90 SCFM unit with a 16 to 1 pressure ratio, have been established and a design for an experimental, oil-lubricated unit suitable for laboratory testing evolved. The design is based, in part, on information obtained from tests on the Arthur D. Little, Inc. (ADL) 1 to 3 Hp scroll compressor. The results of these tests are described.

COM-75-11029/6GA PC$3.25/MF$2.25
National Bureau of Standards, Washington, D.C.
Making the Most of Your Energy Dollars in Home Heating and Cooling.
Consumer information series (Final),
Madeleine Jacobs, and Stephen R. Petersen.
Jun 75, 20p NBS-CIS-8
Sponsored in part by Federal Energy Administration, Washington, D.C.
Paper copy also available from GPO as C13.53:8.

Descriptors: *Energy conservation, *Residential buildings, Insulation, Storm windows, Doors, Weatherstripping, Caulking, Space heating, Air conditioning, Houses.

The report provides basic energy conservation information of an economic nature to homeowners. It is concerned primarily with energy conservation improvements which will decrease heating and cooling costs in houses. Investment in insulation, storm windows and doors, and weatherstripping/caulking is examined with regards to different climates and different energy prices in order to determine the combination of these improvements which will provide the greatest long-run economies in space heating and cooling to the homeowner. Information of a general nature on the proper use of such improvement is outlined and further references are listed.

COM-75-50460/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Air Infiltration Measurements in a Four-Bedroom Townhouse Using Sulfur Hexafluoride as a Tracer Gas.
Final rept.,
Charles M. Hunt, and Douglas M. Burch. 1975, 16p
Pub. in ASHRAE (American Society of Heating, Refrigeration and Air-Conditioning Engineers) Transactions, v81 pt1 p186-201 1975.

Descriptors: *Residential buildings, *Air flow, Ventilation, Sulfur hexafluoride, Mixing, Air circulation.
Identifiers: Reprints, *Tracer studies, Air infiltration.

Air infiltration measurement were made in a four-bedroom townhouse by the tracer dilution method using sulfur hexafluoride (SF6) as the tracer gas. The house was contained in an environmental chamber with control over both the inside and outside temperature, with essentially no wind velocity. The well-known correlation between inside/outside temperature difference and infiltration rate was observed, and under conditions of negligible wind velocity the effect of sealing doors and ducts was investigated. Simultaneous use of SF6 and He as tracer gases gave no evidence that molecular diffusion played a significant role in the measurement. Different methods of collecting air samples for analysis were compared. SF6 measurements were also compared with air exchange rates imposed on the house by means of a fan. Finally, the effects of poor mixing were analyzed by comparing the expected results in the case of perfect mixing with those expected in the case of air exchange without mixing and with imperfect mixing.

NTIS/PS-75/689/0GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Solar Space Heating and Air Conditioning (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Audrey S. Hundemann. Sep 75, 128p*
Supersedes NTIS/PS-75/345.

Descriptors: *Solar space heating, *Bibliographies, *Solar air conditioning, *Buildings, Feasibility, Economic factors, Project planning, Environmental impacts, Social effect.

Presented are abstracts primarily dealing with the technical feasibility of solar heating and cooling of buildings. Included are a few abstracts of reports on solar energy as a national energy resource; solar energy research program alternatives; and economic, social, environmental, and institutional factors affecting the feasibility of using solar energy for heating and cooling buildings. (Contains 123 abstracts)

N75-26304/6GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Comparison under a Simulated Sun of Two Black-Nickel-Coated Flat-Plate Solar Collectors with a Nonselective Black-Paint-Coated Collector.
F. F. Simon. Jun 75, 23p NASA-TM-X-3226, E-8236

Descriptors: *Metal coatings, *Nickel, *Performance tests, *Solar collectors, Environment simulation, Sun.

For abstract, STAR 1317

N75-26310/3GA PC$7.00/MF$2.25
Hamilton Standard, Windsor Locks, Conn.
Lightweight Long Life Heat Exchanger.
Final Report, 1 Jul. 1973 - 30 Apr. 1975.
E. K. Moore. Apr 75, 179p NASA-CR-141873, SVHSER-6534
Contract NAS9-13552

Descriptors: *Condensers (Liquifiers), *Heat exchangers, Aluminum, Composite materials, Spacecraft components.

For abstract, STAR 1317

N75-26495/2GA PC$7.25/MF$2.25
Honeywell, Inc., Minneapolis, Minn.
Development of Flat-Plate Solar Collectors for the Heating and Cooling of Buildings.
Final Report.
J. W. Ramsey, J. T. Borzoni, and T. H. Holland.
Jun 75, 209p NASA-CR-134804, HONEYWELL-2852-40057
Contract NAS3-17862

Descriptors: *Air conditioning, *Buildings, *Solar collectors, *Solar heating, Computerized simulation, Design analysis, Energy conversion efficiency, Energy policy, Flat plates, Heat transfer, Solar energy.

For abstract, STAR 1317

PATENT-3 866 786
Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Energy Absorbing Structure in a Steam Generator.
Patent,
Adrian B. Van Weeideren. Filed 22 Sep 72, patented 18 Feb 75, 3p PAT-APPL-291 477
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Boilers, *Patents, Liquid metals, Sodium, Linings, Energy absorption.
Identifiers: PAT-CL-220-10.

The patent concerns an energy absorbing liner structure at the inside of a sodium-steam generator wall which consists of two concentric thin-walled cylinders. Thin-walled tubes filled with tight compacted steel wool are fitted in the space between the two concentric cylinders. This energy absorbing structure will prevent damage to the vessel wall resulting from the effects of a sodium-water reaction.

PATENT-3 868 994
Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Liquid Metal Operated Heat Exchanger.
Patent,
John Paul Petrek. Filed 26 Feb 73, patented 4 Mar 75, 9p PAT-APPL-335 851
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Heat exchangers, *Patents, Liquid metals, Evaporators, Boilers.
Identifiers: PAT-CL-165-142.

The patent relates to a heat exchanger arrangement of the shell and tube type especially adapted for the use of high temperature liquid metal as a heating medium. The arrangement incorporates a tube bundle comprising a plurality of bayonet tube assemblies through which the liquid metal is circulated in indirect heat exchange relation with vaporizable fluid that flows through the shell. The tube assemblies incorporate a double walled bayonet tube containing a gas space which provides a thermal barrier to minimize heat loss from the heating medium. Various embodiments of evaporator and evaporator-superheater organizations using the heat exchanger arrangement are described.

13B. Civil Engineering

AD-A013 771/1GA PC$3.75/MF$2.25
Air Force Weapons Lab Kirtland AFB N Mex
Electromagnetic Attenuation Properties of Clay and Gravel Soils.
Final rept. Feb-Jun 74,
Dennis L. Brown. Jul 75, 25p Rept no. AFWL-TR-74-166

Descriptors: *Soils, *Nondestructive testing, Clay, Gravel, Radiation attenuation, Thickness, Measurement, Pavements, Microwaves, Microwave frequency, Runways.
Identifiers: Soil water, Airfield landing areas.

The electromagnetic attenuation properties of clay and gravel soils were measured as a function of moisture content and frequency. Measurements were done at frequencies in the 0.5 to 4.5 GHz range. Soil samples were compounded in the laboratory at approximately 10, 50, and 90 percent saturation. Sample

thickness was in the range of 2.5 to 20.3 cm. Each homogeneous sample was sealed in a polyethylene container to retain the total moisture and maintain a constant moisture profile with depth. The results indicate that this method cannot satisfactorily determine the thickness of gravel or clay soil layers over a range of moisture contents which woild be experienced in field conditions.

AD-A013 773/7GA PC$6.25/MF$2.25
Argonne National Lab Ill
Air Quality Assessment Model (AQAM) Field Data Collection Guide.
Final rept. 1 Jun 74-15 Jul 75,
Bernard Todd Delaney. Aug 75, 171p AFWL-TR-75-220
See also AD-A013 533.

Descriptors: *Air force operations, Assessment, Impact, Air quality, Environmental protection, Mathematical models, Emission, Inventory, Handbooks, Data acquisition, Data reduction.
Identifiers: Air quality assessment model, Air quality maintenance, *Air pollution abatement, Management guidelines.

This guide is designed to provide a detailed procedure for obtaining input data for the United States Air Force/Argonne National Laboratory Air Quality Assessment Model (AQAM). AQAM is a computer model developed to assess the impact of Air Force operations on surrounding air quality. The quide describes precisely what data are required, where the data can be obtained, and how the raw data are reduced to usable form. These reduced data are used in AQAM to produce an accurate pollution emission inventory. A section detailing use of the gathered data for hand calculations is also included.

AD-A013 985/7GA PC$3.25/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
Lock Design, Sidewall Port Filling and Emptying System.
Final rept.,
Thomas E. Murphy. Jul 75, 20p Rept no. AEWES-Misc-Paper-H-75-7

Descriptors: *Inland waterways, Walls, Ports(Openings), Filling, Turbulence, Valves, Water flow.
Identifiers: *Locks(Waterways), *Navigation locks, Design criteria.

This report presents and summarizes guidance for design of sidewall port filling and emptying systems for navigation locks.

AD-A014 044/2GA PC$10.00/MF$2.25
Battelle Pacific Northwest Labs Richland Wash
Logistic Requirements and Capabilities for Response to Oil Pollution in Alaska.
Final rept.,
P. L. Peterson, M. M. Orgill, W. H. Swift, and W. V. Loscutoff. Mar 75, 375p USCG-D-97-75
Contract DOT-CG-23223-A
See also report dated Feb 74, AD-784 099.

Descriptors: *Oil spills, *Pipelines, *Logistics support, *Alaska, Arctic regions, Subarctic regions, Pack ice, Tundra, Rivers, Sites, Remote areas, Permafrost, Transportation, Environmental protection, Drainage, Offshore drilling.
Identifiers: DOT/5C, *Trans Alaska pipeline, *Crude oil, Pipeline transportation, Petroleum pipelines, DOT/4BZ/BL.

The report identifies present and projected logistic support requirements for response to oil spills in the arctic and sub-arctic regions of Alaska. Area response is based on estimates of the most probable course of petroleum development within the state. The present logistic support capability of the U.S. Coast Guard, military organizations, other federal agencies and private industry is identified and compared to future response requirements. A set of guidelines was used to assess the response requirements in various environmental settings (moving pack ice, open water, tundra, etc.). The guidelines included the number of personnel and amount of equipment to be transported, time on scene, and initial response time. Fourteen selected sites were evaluated.

AD-A014 045/9GA PC$5.25/MF$2.25
Foster-Miller Associates Inc Waltham Mass
Development of a Centrifugal System for Separation of Oil and Solids from Shipboard Discharge Water.
Final rept.,
A. R. Guzdar, A. C. Harvey, J. Potter, and W. M. Mack. Jul 75, 109p USCG-D-118-75
Contract DOT-CG-24287-A

Descriptors: *Oil pollution, *Water pollution, Material separation, Centrifuge separation, Performance(Engineering), Shipboard, Test methods, Chemical analysis, Coalescence.
Identifiers: Oil pollution control, *Oil water separators, Bilge water, Ballast water, Design, DOT/5C.

Initial design and laboratory testing of an oil-solids-water separating system is described. The system is intended to process ships' bilge water at a rate of 50 gpm and provide water effluent containing less than 15 ppm of oil. The primary components of the final design are: (1) a cleanable bag strainer to retain coarse and fibrous solids, (2) a centrifugal pump that also separates setteable solids, (3) a coalescing centrifuge that separates well-dispersed oil, and (4) an oil-water monitor that continuously measures and records the oil-in-water concentration of the effluent. Results of component testing indicates that the overall system is capable of processing 50 gpm of bilge water containing concentration of up to 10 percent No. 2 fuel or lube oil and discharging water effluent with 15 ppm or less of oil. The following elements of this system design are described in detail: (1) the test evaluation of the Fram-Akers primary separator; (2) the development and testing of the FMA Solids-Oil-Separating Pump; (3) the evaluation of the laboratory model FMA Centrifugal Coalescer; (4) the development and testing of the FMA Shipboard Centrifugal Coalescer; and (5) the synthesis of the Shipboard Separator System.

COM-75-11094/0GA PC$3.75/MF$2.25
National Oceanic and Atmospheric Administration, Silver Spring, Md. Air Resources Labs.
A Regional-Continental Scale Transport, Diffusion, and Deposition Model. Part I. Trajectory Model. Part II. Diffusion-Deposition Models.
Technical memo.,
Jerome L. Heffter, Albion D. Taylor, and Gilbert J. Ferber. Jun 75, 34p NOAA-TM-ERL-ARL-50, NOAA-75072306

Descriptors: *Atmospheric circulation, *Air pollution, *Atmospheric diffusion, Transport properties, Statistical analysis, Computation, Atmospheric models.

The ARL has developed a computerized post-facto trajectory model intended primarily for calculating the transport, diffusion, and deposition of effluents on regional and continental scales. A month, season, or year of trajectories at 6-hourly time intervals may be calculated forward or backward in time from any origin in the Northern Hemisphere for durations up to 10 days. Trajectory computations use winds at any altitude above sea level or winds averaged through any desired layer above average terrain. Computer output includes a listing of individual trajectory end points after selected durations, plotted trajectories for any desired map scale on either Mercator or Polar Stereographic projections, and plotted maps showing percent frequency of trajectory traverses over grid squares. A Gaussian plume model is combined with the trajectory model to calculate long-term mean ground-level air concentrations and deposition amounts. Another model calculates short-term mean ground-level air concentrations for selected sampling stations. Computer output includes plotted maps showing long-term concentrations and deposition amounts, and tables of short-term concentrations where the contributions from individual plumes are identified.

COM-75-50185-03-03/GA
(Order as COM-75-50185-03)
National Marine Fisheries Service, Beaufort, N.C. Atlantic Estuarine Fisheries Center.
Experiments on Some Possible Effects of Tire Reefs on Pinfish 'Logodon rhomboides' and Black Sea Bass 'Centropristis striata',
R. B. Stone, L. C. Coston, D. E. Hoss, and F. A. Cross. Mar 75, 4p MFR-Paper-1128 NOAA-75042901-3
Included in Marine Fisheries Review, v37 n3 p18-20 Mar 75.

Descriptors: *Water pollution, *Reefs, *Marine fishes, Tires, Bass, Leaching, Coasts, Zinc, Insecticides, Chlorine organic compounds, Biphenyl, Chlorohydrocarbons, Atlantic Coast(United States), Gulf Coast(United States).
Identifiers: *Artificial reefs, Lagodon rhomboides, Centropristis striata, Water pollution effects(Animals).

A simulated tire reef was constructed in a 2,000-liter circular fiberglass tank to determine if pollutants would leach from the tires and affect pinfish (Lagodon rhomboides) or black sea bass (Centropristis striata), two fishes commonly associated with artificial reefs on the Atlantic and Gulf Coasts of the United States. Periodic samples of these fishes from both control and experimental tanks showed no significant increase in concentrations of zinc, organochlorine insecticides, or polychlorinated biphenyls (PCB's) in either pinfish or black sea bass.

NTIS/PS-75/665/0GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Dial-A-Ride (A Bibliography with Abstracts).
Rept. for 1964-Jul 75,
Gerald H. Adams. Aug 75, 64p*

Descriptors: *Bibliographies, *Dial a ride systems, Passenger transportation, Urban transportation, Transportation development, Travel patterns, Travel demand, Demand forecasting, Mathematical models, Transit fares, Transportation management, Transportation problems.
Identifiers: *Demand responsive transportation systems, *Personal rapid transit, *Paratransit.

Descriptions and discussions are presented of the dial-a-ride concept, the benefits and costs of personal rapid transit systems, experimental designs, scheduling, demand-responsive public transportation, travel patterns, vehicles, computerized modelling, communication systems, demand forecasting, fare structures, ridership, management, problems, and other related topics. (Contains 59 abstracts)

NTIS/PS-75/672/6GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Flexible Highway Pavements. Vol. 1. 1964-1969 (A Bibliography with Abstracts).
Rept. for 1964-Dec 69,
Guy E. Habercom, Jr. Aug 75, 250p*

See also NTIS/PS-75/673.

Descriptors: *Bibliographies, *Flexible pavements, Bituminous coatings, Foundations(Structures), Roads, Bituminous concretes, Pavement bases, Construction materials, Mechanical properties, Mechanical tests, Abstracts, Highways.

Flexible pavement construction, construction materials, and mechanical properties of flexible pavements are evaluated in reports generated under Government-sponsored research in highway engineering. (Contains 245 abstracts) See also NTIS/PS-75/076, Bridges: Construction and Construction Materials; NTIS/PS-75/518, 519, and 520, Airfield pavements, and NTIS/PS-75/677, 678, and 679, Concrete Pavements.

NTIS/PS-75/673/4GA

PC$25.00/MF$25.00

National Technical Information Service, Springfield, Va.

Flexible Highway Pavements. Vol. 2. 1970-1974 (A Bibliography with Abstracts).

Rept. for 1970-Dec 74,

Guy E. Habercom, Jr. Aug 75, 304p*

See also NTIS/PS-75/674.

Descriptors: *Bibliographies, *Flexible pavements, Bituminous coatings, Foundations(Structures), Roads, Bituminous concretus, Pavement bases, Construction materials, Mechanical properties, Mechanical tests, Highways, Abstracts.

Flexible pavement construction, construction materials, and mechanical properties of flexible pavements are evaluated in reports generated under Government-sponsored research reports in highway engineering. (Contains 299 abstracts) See also NTIS/PS-75/076, Bridges: Construction and Construction Materials; NTIS/PS-75/518, 519, and 520, Airfield Pavements; and NTIS/PS-75/677, 678, and 679, Concrete Pavements.

NTIS/PS-75/674/2GA

PC$25.00/MF$25.00

National Technical Information Service, Springfield, Va.

Flexible Highway Pavements. Vol. 3. 1975 (A Bibliography with Abstracts).

Rept. for 1975,

Guy E. Habercom, Jr. Aug 75, 46p*

See also NTIS/PS-75/673.

Descriptors: *Bibliographies, *Flexible pavements, Bituminous coatings, Foundations(Structures), Roads, Bituminous concretes, Pavement bases, Construction materials, Mechanical properties, Mechanical tests, Highways, Abstracts.

Flexible pavement construction, construction materials, and mechanical properties of flexible pavements are evaluated in reports generated under Government-sponsored research in highway engineering. (Contains 41 abstracts) See also NTIS/PS-75/076, Bridges: Construction and Construction Materials; NTIS/PS-75/518, 519, and 520, Airfield Pavements; and NTIS/PS-75/677, 678, and 679, Concrete Pavements.

NTIS/PS-75/676/7GA

PC$25.00/MF$25.00

National Technical Information Service, Springfield, Va.

Sanitary Landfills (A Bibliography with Abstracts).

Rept. for 1964-Aug 75,

Mona F. Smith. Aug 75, 199p*

Descriptors: *Bibliographies, *Solid waste disposal, *Refuse disposal, Earth fills, Urban areas, Management planning, Water pollution, Storage, Collection, Hauling, Transportation, Regulations, Legislation, Government policies, Garbage disposal, Economic analysis, Regional planning, Land use, Drainage, Ground water, Site surveys.
Identifiers: *Sanitary landfills.

The reports cited relate to sanitary landfill criteria, site selection, management, ground water pollution effects, waste transportation and case studies for individual cities and regions. (Contains 194 abstracts)

NTIS/PS-75/677/5GA

PC$25.00/MF$25.00

National Technical Information Service, Springfield, Va.

Concrete (Rigid) Highway Pavements. Vol. 1. 1964-1970 (A Bibliography with Abstracts).

Rept. for 1964-1970,

Guy E. Habercom, Jr. Aug 75, 209p*

See also NTIS/PS-75/678.

Descriptors: *Bibliographies, *Concrete pavements, Concrete construction, Roads, Concrete durability, Concretes, Reinforced concrete, Construction joints, Mechanical properties, Mechanical tests, Maintenance, Abstracts.
Identifiers: *Rigid pavements.

Concrete (rigid) pavement construction, construction materials, and mechanical properties of concrete pavements are evaluated in reports generated under Government sponsored research in highway engineering. (Contains 204 abstracts) See also NTIS/PS-75/076, Bridges: Construction and Construction Materials; NTIS/PS-75/518, 519, and 520, Airfield Pavements; and NTIS/PS-75/672, 673, and 674, Flexible Highway Pavements.

NTIS/PS-75/678/3GA

PC$25.00/MF$25.00

National Technical Information Service, Springfield, Va.

Concrete (Rigid) Highway Pavements. Vol. 2. 1971-1973 (A Bibliography with Abstracts).

Rept. for 1971-1973,

Guy E. Habercom, Jr. Aug 75, 136p*

See also NTIS/PS-75/679.

Descriptors: *Bibliographies, *Concrete pavements, Concrete construction, Roads, Concrete durability, Concretes, Reinforced concrete, Construction joints, Mechanical properties, Mechanical tests, Maintenance, Abstracts.
Identifiers: *Rigid pavements.

Concrete (rigid) pavement construction, construction materials, and mechanical properties of concrete pavements are evaluated in reports generated under Government sponsored research in highway engineering. (Contains 131 abstracts) See also NTIS/PS-75/076, Bridges: Construction and Construction Materials; NTIS/PS-75/518, 519, and 520, Airfield Pavements; and NTIS/PS-75/672, 673, and 674, Flexible Highway Pavements.

NTIS/PS-75/679/1GA

PC$25.00/MF$25.00

National Technical Information Service, Springfield, Va.

Concrete (Rigid) Highway Pavements. Vol. 3. 1974-July 1975 (A Bibliography with Abstracts).

Rept. for 1974-Jul 75,

Guy E. Habercom, Jr. Aug 75, 66p*

See also NTIS/PS-75/678.

Descriptors: *Bibliographies, *Concrete pavements, Concrete construction, Roads, Concrete durability, Concretes, Reinforced concrete, Construction joints, Mechanical properties, Mechanical tests, Maintenance, Abstracts.
Identifiers: *Rigid pavements.

Concrete (rigid) pavement construction, construction materials, and mechanical properties of concrete pavements are evaluated in reports generated under Government sponsored research in highway engineering. (Contains 61 abstracts) See also NTIS/PS-75/075, Bridges: Construction and Construction Materials; NTIS/PS-75/518, 519, and 520, Airfield Pavements; and NTIS/PS-75/672, 673, and 674, Flexible Highway Pavements.

NTIS/PS-75/681/7GA

PC$25.00/MF$25.00

National Technical Information Service, Springfield, Va.

Cadmium Pollution (A Bibliography with Abstracts).

Rept. for 1964-Aug 75,

Mona F. Smith. Sep 75, 148p*

Supersedes NTIS/PS-75/020.

Descriptors: *Bibliographies, *Cadmium, *Air pollution, *Water pollution, Toxicity, Water quality, Chemical analysis, Particles, Sources, Air quality, Transport properties, Solid waste disposal, Materials recovery, Water analysis.
Identifiers: Water pollution detection, Air pollution control, Water pollution control, Water pollution effects, Air pollution effects, Air pollution detection.

Air and water pollution by cadmium are covered in this bibliography, including sources, control techniques, emissions, transport properties, effects on plants, animals and humans, and detection and analysis. (Contains 143 abstracts)

NTIS/PS-75/684/1GA

PC$25.00/MF$25.00

National Technical Information Service, Springfield, Va.

Offshore Structures (A Bibliography with Abstracts).

Rept. for 1964-Aug 75,

Guy E. Habercom, Jr. Sep 75, 115p*

Supersedes NTIS/PS-74/123.

Descriptors: *Bibliographies, *Offshore structures, Site surveys, Ocean environments, Urban planning, Marine terminals, Environmental surveys, Nuclear power plants.
Identifiers: *Floating cities, *Offshore airports.

Offshore structures are investigated relative to their feasibility, design, construction, marine environments, and environmental impact in these Government-sponsored research report. (Contains 110 abstracts) See also NTIS/PS-75/540, Offshore Drilling.

N75-25945/7GA PC$3.25/MF$2.25

National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

Jet Aircraft Emissions During Cruise: Present and Future.

J. S. Grobman. 1975, 15p NASA-TM-X-71750, E-8390

Conf-Presented at the 7TH Aircraft Systems and Technol. Meeting, Los Angeles, 4-7 Aug. 1975; Sponsored by Aiaa.

Descriptors: *Commercial aircraft, *Cruising flight, *Exhaust gases, *High altitude, Engine design, Forecasting.

For abstract, STAR 1317

N75-26415/0GA PC$3.75/MF$2.25

National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.

Vibration Responses of Test Structure No. 2 During the Edward Air Force Base Phase of the National Sonic Boom Program.
D. S. Findley, V. Huckel, and H. H. Hubbard. Jun 75, 35p NASA-TM-X-72704

Descriptors: *Buildings, *Residential areas, *Sonic booms, *Structural vibration, Acceleration stresses (Physiology), Aircraft noise, B-58 aircraft, F-104 aircraft, Flight tests, Strain gages.

For abstract, STAR 1317

N75-26931/6GA PC$3.75/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
Technology Transfer-Transportation.
Annual Report, 15 Aug. 1973 - 15 Aug. 1974.
T. Anyos, R. Lizak, J. Wilhelm, and K. Hirschberg. Sep 74, 39p NASA-CR-143040
Contract NASW-2455

Descriptors: *Aerospace engineering, *Safety devices, *Technology transfer, *Urban transportation, Design analysis, Highways, Rail transportation, Trucks.

For abstract, STAR 1317

ORNL-4940 PC$7.60/MF$2.25
Oak Ridge National Lab., Tenn.
Transient, Two-Dimensional, Discrete-Element, Far-Field Model for Thermal Impact Analysis of Power Plant Discharges in Coastal and Offshore Regions. Part I. General Description of the Mathematical Model and the Results of an Application.
A. H. Eraslan. Feb 75, 164p
Contract W-7405-eng-26

Descriptors: (*Thermal power plants, Thermal effluents), (*Thermal effluents, *Mathematical models), (*Coastal waters, *Thermal pollution), (*Nuclear power plants, Thermal effluents), Aquatic ecosystems, Computer calculations, Computer codes, Daily variations, Depth, Diffusion, Environment, F codes, Fluid flow, Heat transfer, Hydrodynamics, Mass, Mixing, Offshore sites, Seawater, Shores, Thermal stresses, Thermodynamics, Tide, Time dependence.

For abstract, see NSA 32 03, number 06467.

PB-231 300-16/GA PC$25.00/MF$25.00
Environmental Protection Agency, Washington, D.C. Grants Administration Div.
Wastewater Treatment Construction Grants Data Base Public Law 92-500 Project Records. Grants Assistance Programs.
Jul 75, 91p* EPA/GAD/2-75-008
Paper copy available on subscription $100.00/year domestic, $125.00/year foreign.

Descriptors: *Sewage treatment, *Industrial waste treatment, *Water pollution control, *Grants, Industrial plants, Construction.
Identifiers: *Sewage treatment plants.

Awards for wastewater treatment facilities under Public Law 92-500 are listed on a monthly basis. The publication provides the essential information on all awards made during the month listed. The awards are sorted by state and the information provided is applicant identification, grant number, grant title, award date, award amount, grant step such as one-planning, two-design, three-construction, description of facility to be constructed and other data.

PB-242 992/6GA PC$3.75/MF$2.25
New York State Dept. of Transportation, Albany. Engineering Research and Development Bureau.
Depth of Concrete Cover Over Bridge Deck Reinforcement.
Interim rept.,
Duane E. Amsler, and William P. Chamberlin. May 75, 30p NYSDOT-ERD-75-RR-29

Descriptors: *Bridge decks, *Concrete, Highway bridges, Depth, Standardization, Depth detectors, Design standards, New York.
Identifiers: DOT/4CZ/CB.

Fifty concrete bridge deck spans in New York State were surveyed with a pachometer for depth of clear concrete cover. Compliance with a design requirement for a minimum of 2 in. occurred at 77.3 percent of the locations measured. Spans having a high degree of compliance also tended to have relatively uniform cover depths. The degree of compliance appeared to be related to construction practices. The distribution of cover depths on individual spans was generally not normal, and a construction tolerance of plus or minus 1/2 in. was determined to be reasonable for the type of design requirement under which the decks were built.

PB-243 108/8GA PC$3.75/MF$2.25
Federal Highway Administration, Washington, D.C. Structures and Applied Mechanics Div.
The Significance of Pavement Texture.
Final rept.,
Glenn G. Balmer. Feb 75, 44p FHWA/RD-75-12

Descriptors: *Highways, *Pavements, *Texture, Surface properties, Grooving, Aggregates, Skid resistance.
Identifiers: *Tire road interactions, *Hydroplaning, DOT/4CZ/CA.

The paper discusses the influence of roadway surface textures on the skid resistance, the speed-gradient, the wet-pavement accident rate, pavement wear, and the generation of tire-road interaction noise. The tendency of a vehicle to hydroplane is reduced by increasing the texture magnitude. Appropriate textures are developed by using open-graded asphalt friction surface courses and by grooving portland cement concrete with steel tines or a vibrating float while the concrete is plastic. Hardened pavements can be textured by grooving with a diamond saw or by resurfacing with an overlay. More development is needed in texture measurement techniques, especially in automating the stereo-photo interpretation method and the linear polarized laser technique.

PB-243 213/6GA PC$5.75/MF$2.25
Pennsylvania Transportation Inst., University Park.
Flexible Highway Pavement Design - The State of the Art. Volume I.
Interim rept. Sep 71-Feb 73,
E. S. Lindow, M. G. Sharma, H. Recart, and T. D. Larson. Feb 73, 150p* PTI-7504

Descriptors: *Highways, *Flexible pavements, *Reviews, Design, Design criteria, Soil properties, Frost heave, Subgrades, Asphalts.
Identifiers: DOT/4CZ/CA.

This report is the first of an eight-volume series which constitutes the Interim Report for Penn-DOT Research Project 71-7 entitled 'An Evaluation of Pennsylvania's Flexible Pavement Design Methodology.' This volume is a literature survey and critical review of flexible pavement design for highways.

PB-243 224/3GA PC$4.25/MF$2.25
Simat, Helliesen and Eichner, Inc., Newton Center, Mass.
Retrospective Rail Line Abandonment Study.
Final rept.,
Bruce Whelte. Mar 73, 75p 342-73 DOT-TPI-75-1
Contract DOT-OS-20108
See also PB-243 225.

Descriptors: *Rail transportation, *Services, Abandonment, Freight shippers, Communities, Economic impact, Midwest Region(United States), Northeast Region(United States), Southeast Region(United States).
Identifiers: DOT/2C, DOT/3C.

The study reports the results of a case examination of 10 rail abandonment proceedings conducted before the Interstate Commerce Commission in the early- to mid-1960's. The objectives of the research were to ascertain if analysis of the proceeding records in combination with field and telephone interviews with protestants, some five years after the abandonments, could be successfully employed to reveal (1) whether rail branch line abandonments had had a significant impact on communities or shippers formerly served by the branch and (2) whether the case record developed during the course of the proceedings provided a reliable predictive guide to the actual impacts of the abandonment.

PB-243 225/0GA PC$4.25/MF$2.25
Simat, Helliesen and Eichner, Inc., Newton Center, Mass.
Additional Retrospective Rail Line Abandonment Studies.
Final rept.,
Bruce Whelte. Mar 75, 65p 400-74 DOT-TPI-75-2
Contract DOT-FR-4-5002
See also PB-243 224.

Descriptors: *Rail transportation, *Services, Abandonment, Freight shippers, Communities, Economic impact, Midwest Region(United States), Northeast Region(United States).
Identifiers: DOT/2C, DOT/3C.

The study presents research findings which are the result of analyzing and assessing the impact of railroad line abandonments in several communities in the Northeast and Midwest.

PB-243 363/9GA PC$4.25/MF$2.25
Amoco Oil Co., Naperville, Ill. Research and Development Dept.
Demonstration of Reduced Hydrocarbon Emissions from Gasoline Loading Terminals.
Final rept. Jun 73-Sep 74,
D. C. Walker, H. W. Husa, and I. Ginsburgh. Jun 75, 55p EPA/650/2-75/042
Contract EPA-68-02-1314

Descriptors: *Gasoline, *Hydrocarbons, *Oxidation, Tank trucks, Materials handling equipment, Loading procedure, Cost effectiveness.
Identifiers: *Service stations, *Air pollution control.

The report gives results of test work to demonstrate the effectiveness of hydrocarbon oxidation for reducing emissions from a gasoline truck loading terminal in Philadelphia that pumps about 2 million barrels of gasoline per year. Major objectives of the program were to determine control efficiency, to observe operational characteristics, and to compare this installation with other known systems. Tests run during each of the four seasons showed that the oxidizer safely and efficiently disposes of 99+% of the vapor it receives, even in extremely cold weather when the air-gasoline vapor mixture is in the flammable range. Initially, a large portion of the vapor from the trucks was not reaching the oxidizer, primarily because of blockage caused by liquid carryover to the vapor collection system. After this was cor-

rected, collection and disposal of the vapor exceeded 90%. High efficiency and low flame temperatures of the oxidizer limit formation of emissions.

PB-243 402/5GA PC$5.75/MF$2.25
Owens-Illinois, Inc., Pittsburgh, Pa. Fecker Systems Div.
In-Stack Transmissometer Evaluation and Application to Particulate Opacity Measurement.
Final rept.,
Edward D. Avetta. Jan 75, 127p EPA-650/2-75/008
Contract EPA-68-02-0660

Descriptors: *Air pollution, *Transmissometers, *Flue gases, *Monitors, Particles, Iron and steel industry, Sulfuric acid, Portland cements, Industrial plants, Performance evaluation, Field tests, Laboratory tests, Opacity.
Identifiers: *Air pollution detection, Particulates.

A laboratory evaluation and field testing program has been carried out to investigate the performance of a commercially available RM-4 Transmissometer as an in-situ monitor of industrial exhaust stack emissions. The laboratory phase of the program involved specific tests of the transmissometer design characteristics, operational parameters, extended time performance, and calibration. The instrument was then installed in the field for a minimum period of 30 days at each of three sites which were: (1) a basic oxygen furnance for the manufacture of steel, (2) an industrial chemical plant for the manufacture of sulfuric acid, and (3) an industrial plant for the manufacture of Portland cement. At each of these three sites opacity measurements were made of the stack exit plume for comparison with transmissometer generated data.

PB-243 407/4GA PC$11.25/MF$2.25
Institute for Policy Analysis, La Jolla, Calif.
Measuring External Effects of Solid Waste Management.
Socioeconomic environmental studies series (Final),
Richard Schmalensee, Ramachandra Ramanathan, Wolfhard Ramm, and Dennis Smallwood. Mar 75, 450p* EPA/600/5-75-010
Grant EPA-R-801673

Descriptors: *Refuse disposal, *Solid waste disposal, *Air pollution, *Water pollution, Earth fills, Economic analysis, Classification, Land use, Noise pollution, Management planning, Benefit cost analysis, Real property, Design, Models, California.
Identifiers: *Sanitary landfills.

This study analyzes the environmental impact of using sanitary landfills for disposing of solid waste. The relevant economic theory concerned with the measurement and valuation of external effects is developed and previous empirical impacts of various activities are reviewed. Both the theoretical and empirical evidence suggests that the costs and benefits of external effects are extremely difficult to measure directly but under certain circumstances property value studies can be used to obtain indirect estimates. A survey of the technology of sanitary landfills suggests that a properly designed fill will cause very little air and water pollution, but may impose visual and noise pollution on nearby residents. These hypotheses are tested with data on property surrounding four sanitary landfills in Los Angeles County. A model of the determinants of residential property values is formulated and estimated.

PB-243 415/7GA
Mag Tape $150.00;Foreign $190.00
Charlotte, N.C. USAC Project.
Code Enforcement Municipal Cobol Computer Programs Module Technical Tape.
Software,
Joseph R. Motto, Becky Helms, and H. W. Jamison. Jun 75, 1 reel mag tape HUD/DF-75/009
Contract HUD-H-1216
Available only in 9 track, 800 or 1600 bpi, odd parity, EBCDIC. Documentation available from Charlotte USAC Project, Charlotte, N.C. 28202 as MIS-3301/017, MIS-4302/017, MIS-4305/017 and MIS-7601/017.

Descriptors: *Software, *Local government, *Urban information systems, *Building codes, Magnetic tapes, Building permits, Management information systems, Information retrieval, North Carolina.
Identifiers: USAC project, *Charlotte(North Carolina).

This tape contains the USAC Municipal Code Enforcement Module for the Charlotte, N.C. Integrated Municipal Information System (IMIS). This module provides municipal governments with an effluent and effective method for evaluating, recording and reporting violations of state and local housing codes. The basic objectives of the module are to: (1) record and maintain a complete history of each code enforcement case, (2) establish control procedures for recording and reporting code violations, (3) provide an on-line display capability for data collection and retrieval of case history information, (4) generate management summary and statistical report reflecting case activity by street address, geographic area and employee, (5) provide key information required for reporting housing activities of municipal governments to the Federal Urban Housing Development Agency. This module provides for the storage and retrieval of data in such a way as to give the user continuity regarding each case. There are 6 programs recorded on the tape. Technical documentation describing this module includes: MIS-3301/017, Code Enforcement Module Design Specification; MIS-4302/017, Code Enforcement Module Computer Program; MIS-4305/017, Code Enforcement Module Implementation Demonstration Plan; MIS-7601/017, Code Enforcement Module User's Manual. 1.4 M bytes of core storage and 15.8 M bytes of disk storage are needed to operate this module on a Burroughs 6700 computer...Software description: These programs are written in the Burroughs COBOL programming language for implementation on the Burroughs Model 6700 computer using the Burroughs MCP operating system, release 2.7. The teleprocessing package is the Burroughs Generalized MCS. The Data Base Management system is the Burroughs DMS II.

PB-243 417/3GA PC$8.75/MF$2.25
Environmental Protection Agency, Cincinnati, Ohio. Office of Water Program Operations.
Self-Monitoring Procedures: Basic Parameters for Municipal Effluents.
Final rept.,
Charles E. Sponagle. Sep 74, 298p* EPA/430/1-74/015

Descriptors: *Sewage treatment, *Water pollution, *Water analysis, *Manuals, Monitors, pH, Oxygen, Dissolved gases, Sampling, Biochemical oxygen demand, Coliform bacteria, Fluid flow, Chlorine, Filtration, Measurement, Instrumentation, Laboratory tests, Venture meters, Regulations, Standards.
Identifiers: *Sewage treatment effluent, *Water pollution sampling, Dissolved oxygen, Sewage flow rate, Open channel flow.

This course is designed for the treatment plant operator or technician who is required to monitor effluent discharges under a National Pollution Discharge Elimination System (NPDES) Permit, and who has had little or no previous experience in wastewater analysis or flow measurement. Parameters included in this course are Biochemical Oxygen Demand, pH, Fecal Coliform, Residual Chlorine, Suspended Solids, and Open Channel Flow.

PB-243 453/8GA
Mag Tape $150.00;Foreign $190.00
Reading, Pa. USAC Project.
Reading USAC Project Data Management Technique Computer Program Module, Release No. 1.
Software,
Harold George. May 75, 1 reel mag tape USAC-IMIS-RDG-007 HUD/DF-75/005
Contract HUD-H-1212
Specify tape recording mode desired: 9 track, 800 or 1600 bpi, odd parity, EBCDIC; or 7 track, 556 or 800 bpi, odd or even parity, BCD. Documentation available from Reading USAC Project, Reading, PA., 19603 as USAC-RPA2-1101 and USAC-RPA2-1102.

Descriptors: *Software, *Local government, *Urban information systems, *Computer programs, Magnetic tapes, Urban technology, Information retrieval, Management information systems, Technology transfer, Pennsylvania.
Identifiers: USAC project, *Reading(Pennsylvania).

This tape contains the USAC Municipal Data Management Technique Module (DMT) for the Reading, Pennsylvania Integrated Municipal Information System (IMIS). Information on the tape includes the source code for existing root logic sets, linkage logic sets (APPLINK, SYSLINK), and all internal and integral services developed and implemented in Reading, Pennsylvania under the auspices of USAC (Urban Systems Inter-Agency Committee). In addition, two sample job control streams are offered for guidance in the development and operation of this code as a system network (Data Management Technique) in a candidate city. 32 k bytes of core storage and 32 M bytes of disk storage are needed to operate this module on a UNIVAC Model 9300 II. Technical documentation describing this Module include: USAC-RPA2-1101, Data Management Techniques and Systems Software Services for Reading PED/IMIS; USAC-RPA2-1102, Integrated Management Information Systems and a Small City...Software description: These programs are written in COBOL for implementation on a UNIVAC Model 9300 II computer using the UNIVAC 0S500 DNCOS Rev. 4 operating systems. The data base management system software package is the Reading DMT, version 1, release1, level 1.

PB-243 458/1GA
Mag Tape $150.00;Foreign $190.00
Reading, Pa. USAC Project.
Reading USAC Project Traffic Accident Recording Computer Program Module, Release No. 1.
Software,
Harold George. May 75, 1 reel mag tape USAC-IMIS-RDG-010 HUD/DF-75/010
Contract HUD-H-1212
Specify tape recording mode desired: 9 track, 800 or 1600 bpi, odd parity, EBCDIC; or 7 track, 556 or 800 bpi, odd or even parity, BCD. Price includes documentation, PB-237 258 and PB-238 266.

Descriptors: *Software, *Local government, *Urban information systems, *Traffic safety, Magnetic tapes, Accident investigations, Information retrieval, Management information systems, Pennsylvania.
Identifiers: USAC project, *Reading(Pennsylvania).

This tape contains the USAC Municipal Traffic Accident Recording Module for the Reading, Pa., Integrated Municipal Information System (IMIS). This module processes information col-

lected on traffic accident reporting forms and assembles these data into accident history files which comprise a portion of the system data base. This information can then be retrieved to produce periodic (monthly and yearly) reports. The module also has the facility to query the accident portion of the system data base for any accidents meeting optional search parameter criteria. Its services, while available to all departments within city government, were designed around requirements supplied by the Traffic Law Enforcement Division of the Reading Bureau of Police. There are 8 programs recorded on the tape. Technical documentation describing this module include: PB-237 258, Design Specifications for the Traffic Accident Recording Module; PB-238 266, Program Specifications for the Traffic Accident Recording Module; and USAC-RPAZ-7031, The Traffic Accident Recording Module, User's Manual. 32K bytes of core storage and 32M bytes of disk storage are needed to operate this module on a UNIVAC Model 9300 II computer...Software description: These programs are written in the UNIVAC 9300 II COBOL programming language for implementation on a UNIVAC Model 9300 II computer using the UNIVAC 0S500DNCOS operating system. The Reading Data Base Management System is also used to implement this module.

PB-243 465/2GA PC$4.25/MF$2.25
Environmental Protection Agency, Research Triangle Park, N.C. Office of Air Quality Planning and Standards.
Benzo(a)Pyrene and Trace Metals in Charleston, South Carolina.
Final rept.,
Carl Spangler, and Noel de Nevers. Jun 75, 58p EPA/450/2-75/004

Descriptors: *Air pollution, *Polycyclic compounds, *Carcinogens, *Pulmonary neoplasms, Trace elements, Sampling, Public health, Soils.
Identifiers: Air quality, *Benzopyrenes, Air pollution effects(Humans), Charleston(South Carolina), Air pollution sampling.

Charleston, S.C., along with some other cities in the Southeastern Coast and Gulf Coast area, has an anomalously high incidence of deaths resulting from lung cancer-about 50 percent higher than the national average. Benzo(a)pyrene (BaP) and trace metals are widely suspected of being causative agents in lung cancer. A survey of BaP and trace metals in the ambient air in Charleston reveals, however, that the air concentrations are lower than the national averages. To test the view that atmospheric concentrations of BaP can readily be inferred from soil concentrations, soil samples were taken in Charleston at sites roughly corresponding to the area in which air was subject to testing in the air sampling program. From the limited data available, the Charleston soil values of BaP do not appear extraordinarily high. Thus, it seems safe to infer that the abnormally high death rate resulting from lung cancer is not due to higher-than normal exposure to the agents addressed.

PB-243 466/0GA PC$4.25/MF$2.25
Geological Survey, Menlo Park, Calif. Water Resources Div.
Problems Related to Water Quality and Algal Control in Popez Reservoir, San Luis Obispo County, California.
Water-resources investigations (Final rept.),
Richard H. Fuller, Robert C. Averett, and W. G. Hines. Feb 75, 54p USGS/WRI-47-74, USGS/WRD-75/038
Prepared in cooperation with San Luis Obispo County Flood Control and Water Conservation District, Calif.

Descriptors: *Water pollution, *Algae, *Pest control, *Lopez Reservoir, Algicides, Diatoms, Copper sulfates, Stratification, Thermal pollution, Dissolved gases, Oxygen, Water chemistry, Aquatic biology, Chlorophyta, California.
Identifiers: *Water quality data, San Luis Obispo County(California), Anabaena unispora, Stephanodiscus astraea, Cyclotella operculata, Pediastrum duplex, Sphaerocystis schroeteri, *Thermal stratification.

Lopez Reservoir is used for flood control, water supply and recreation. Nuisance algal blooms have been a frequent occurrence in the reservoir since the first summer (1969) after filling. Dominant bloom species include the blue-green alga Anabaena unispora, the diatoms Stephanodiscus astraea and Cyclotella operculata, and the green algae Pediastrum duplex and Sphaerocystis schroeteri. During a bloom of A. unispora, the total cell count at the lake surface was almost 100,000 cells per millilitre of water. Lopez Reservoir is thermally stratified from April until November. Dissolved-oxygen stratification closely parallels the thermal stratification. Anoxic conditions begin to develop in mid-May, and by early July all water below a depth of 40 feet is oxygen deficient. The application of copper sulfate (CuSO4) to reduce algal production has not been completely successful. Possible application rates and methods of determining application rates based upon water chemistry are presented.

PB-243 479/3GA PC$6.25/MF$2.25
Lake Tahoe Area Research Coordination Board, South Lake Tahoe, Calif.
Proceedings: Lake Tahoe Research Seminar III. 17 January 1975. Sands Vagabond Convention Center, South Lake Tahoe, California.
17 Jan 75, 151p NSF/RA/G-75-001
Grant NSF-ISR73-09293-A02
See also report dated Sep 74, PB-240 549. Prepared in cooperation with Lake Tahoe Environmental Education Consortium, South Lake Tahoe, Calif.

Descriptors: *Environmental quality, *Meetings, *Lake Tahoe, Research projects, Highways, Snow removal, Ice prevention, Deicers, Land use, Legislation, Soil erosion, Erosion control, Vegetation, Forest land, Sierra Nevada, Sewage treatment, California.

Lake Tahoe Research Seminars are held quarterly to inform the public and interested researchers of current research projects and to develop lines of communication among those interested and involved in solving the problems of the Tahoe Basin. Topics discussed at the Research Seminar III (January 17, 1975) included: Highway Ice and Snow removal and Deicing Salt Problems at Lake Tahoe; 1975 Census and the Tahoe Basin; Legal Review of Land Use Controls; Erosion and Sediment Control Technology; Revegetation and Erosion Control at Heavenly Valley; Establishing Forest Cover on Harsh Sites in the Sierra Nevada; and Area-wide Waste Treatment and Erosion Control Planning.

PB-243 481/9GA PC$7.00/MF$2.25
Mitre Corp., McLean, Va.
Policy Assessment of the 55 Mile Per Hour Speed Limit.
Final rept. Aug 74-Jun 75,
Hans B. Schechter, and Jerry Pfeffer. May 75, 177p
Grant NSF-C925
Prepared in cooperation with BDM Corp., Vienna, Va.

Descriptors: *Highway transportation, *Legislation, Fuel consumption, Savings, Traffic safety, Policies, Revenue, Economic impact, Law enforcement, Velocity, Social effect.
Identifiers: *Speed limits.

The report presents historical description of the development of the policy. The following areas are researched: Motor vehicle fuel savings; safety aspects; economic impacts-government revenues, government costs, impacts on the transportation industry and on other business and industry (insurance, etc.), impacts on households; social impacts; legal impacts-state legislatures, enforcement. International experience with the 55 mph speed limit is described. Conclusions and recommendations on the policy, enforcement, and data requirements are given.

PB-243 486/8GA PC$3.75/MF$2.25
Lake Tahoe Area Research Coordination Board, South Lake Tahoe, Calif.
Research Needs for the Lake Tahoe Basin,
Barbara Medford. Dec 74, 43p NSF/RA/G-74/030
Grant NSF-GT-39556

Descriptors: *Environmental quality, *Lake Tahoe Basin, Management, Research needs, Natural resources, Policies, Air pollution, Water pollution, Land use, Vegetation, Fishes, Wildlife, Social effect, Bibliographies, California.

The Lake Tahoe Area Research Coordination Board is attempting to compile and summarize research needs of the area. The report is a result of that effort, and focuses on research needs pertinent to environmental management in the Lake Tahoe Basin. Material included was reviewed by both scientists and resource managers in recognition of the fact that planners and administrators increasingly emphasize policies that reflect as much technical information as possible. This initial report is intended to establish a channel of communication among researchers, research sponsors, and research users. The report first provides the necessary perspective with a chapter on trends in Lake Tahoe Basin problems, and then delineates research needs for the next five years in the categories of: Air, water, land and vegetation, fish and wildlife, social sciences, and resource systems. It is necessarily a tentative research agenda, but it represents an important initiative in needs assessment. A bibliography follows the text.

PB-243 499/1GA PC$3.75/MF$2.25
Kentucky Water Resources Inst., Lexington.
Evaluation of Recovery in a Polluted Creek After Installation of New Sewage Treatment Procedures.
Research rept.,
Robert A. Kuehne. May 75, 43p RR-85 W75-09515, OWRT-A-047-KY(1)
Contracts DI-14-31-0001-3817, DI-14-31-0001-4017

Descriptors: *Stream pollution, *Sewage treatment, *Hickman Creek, Sewage, Lagoons(Ponds), Turbidity, Inorganic nitrates, Outfall sewers, Phosphorus organic compounds, Waste water, Biochemical oxygen demand, Algae, Fishes, Kentucky.
Identifiers: Lexington(Kentucky), Chemical oxygen demand, Path of pollutants, *Sewage lagoons, *Water quality data.

Response of Hickman Creek near Lexington, Kentucky to alleviation from serious sewage pollution was studied from January, 1973 through July, 1974. Wastes are now handled from an efficient secondary treatment facility and four sequential polishing lagoons before chlorination and discharge to West Hickman branch. Physico-chemical tests gave no strong indication of residual pollution effects at the start of the study, approximately six months after the treatment facility opened. At low flow a slight oxygen sag, probably associated with algal growth in the lagoons, persists downstream from the outfall. Mean values for turbidity, nitrates and COD are somewhat higher at the outfall than at eleven stations within the basin. Orthophosphates are con-

siderably higher in lagoon discharge than elsewhere in the system, which gains some phosphate from bedrock. While the lagoons place some oxygen demand on West Hickman in the form of unicellular algal growth, they can and do receive surges of input that cannot be accommodated in the treatment plant.

PB-243 516/2GA PC$3.75/MF$2.25
University of Southern Mississippi, Hattiesburg. Bureau of Business Research.
A Case Study of Estuarine Pollution and Local Agency Interactions.
Completion rept.,
Charles P. Cartee, Nell O. Murray, and D. C. Williams, Jr. Jun 75, 48p W75-09620, OWRT-A-089-MISS(1)

Descriptors: *Water pollution abatement, *Mississippi, *Local government, Beaches, Public relations, Mexico Gulf, Estuaries, Interactions.

A case study was made of a specific pollution problem on the Gulf Coast of Mississippi with emphasis on the agency and governmental interface. Numerous personal interviews with representatives of affected political subdivisions and involved agencies were utilized. In depth interviewing revealed many points of conflict between the enforcement agencies and the affected local units of government. Much misunderstanding centered around procedures used in collecting and testing water samples and the evolution and interpretation of the water quality criteria. Several intricate legal questions were found to characterize the problem with respect to the 26-mile, man-made sand beach, especially with respect to jurisdictional responsibilities in providing public notice of the water's quality. The study emphasized (1) the importance of input mechanisms and education of local governmental officials relative to the development, evolution and use of pollution standards, and (2) the need for identifying and establishing jurisdictional authority for bodies of water in terms of public pollution notifications when large expanses of beach front are involved.

PB-243 558/4GA PC$3.75/MF$2.25
Mississippi State Univ., Mississippi State. Dept. of Geology and Geography.
Status of Land Subsidence Due to Ground-Water Withdrawal Along the Mississippi Gulf Coast.
Completion rept.,
Donald M. Keady, Thomas W. Lins, and Ernest E. Russell. Jul 75, 31p W75-09856, OWRT-A-085-MISS(1)
Prepared in cooperation with Mississippi State Univ., Mississippi State. Water Resources Research Inst., and Mississippi State Univ., Mississippi State.

Descriptors: *Land use, *Ground water, *Subsidence, Removal, Water supply, Hydrogeology, Water table, Coasts, Aquicludes, Compacting, Stresses, Aquifers, Texas, Mexico Gulf, Gulf Coast(United States), Louisiana.
Identifiers: *Land subsistence, New Orleans(Louisiana), Baton Rouge(Louisiana), Houston(Texas), *Water level, Ground water potential.

Land subsidence due to ground-water withdrawal along the Mississippi Gulf Coast has not occurred to the measurable extent that it has in New Orleans, La., Baton Rouge, La., and the Houston, Texas, area. A potential for subsidence exists, and future large-scale groundwater developments make the possibility of subsidence important. The quantity of water produced, as well as water-level declines, should be considered in estimating potential for subsidence. Using the average specific-unit compaction value measured in the Houston, Texas area, subsidence due to groundwater withdrawal along the Mississippi Gulf Coast is estimated to be a few inches at most. Decreases in elevation of bench marks of about four to five inches are common along the coast, but this subsidence is attributed to tectonic activity and other causes. Stresses on the aquitards produced by ground-water withdrawal would have to exceed prior loading stress before significant amounts of compaction and land subsidence could occur.

PB-243 565/9GA PC$4.25/MF$2.25
Mississippi Univ., University. Bureau of Business and Economic Research.
Methods to Facilitate Managerial Effectiveness in Municipal Water Systems.
Completion rept.,
Kenneth W. Hollman, Ronald F. Bush, Joseph F. Hair, Jr., Edward E. Milam, and James H. Sellers. Jul 75, 63p W75-09895, OWRT-B-010-MISS(1)
Prepared in cooperation with Mississippi State Univ., Mississippi State. Water Resources Research Inst.

Descriptors: *Water management, *Urban planning, *Management methods, Municipalities, Mathematical models, Cost engineering, Effectiveness, Water supply, Factor analysis, Mississippi, Utilities.
Identifiers: Water management(Applied).

The project focused on the quality of municipal water system management in Mississippi. The primary objectives were to determine what factors play a part in achieving greater efficiency in water system management and and to what extent. An analytic model using multiple discriminant analysis and multiple factor analysis was formulated. A subset of 45 municipal water systems in Mississippi was used for the data base. Initially, twenty-two variables classified by degree of controllability and by major cost category were selected, but the model was later reduced to 12 variables. The study shows how a model with only a small number of variables, but with a high predictive accuracy, can be developed to assign water utilities to appropriate efficiency level groups. Information generated will help to determine the amount of change in cost variables necessary to reach a prespecified cost improvement goal.

PB-243 634/3GA PC$5.25/MF$2.25
Midwest Research Inst., Kansas City, Mo.
St. Louis Refuse Processing Plant: Equipment, Facility and Environmental Evaluations.
Final rept. Sep 74-Jan 75,
L. J. Shannon, D. E. Fiscus, and P. G. Gorman. May 75, 122p EPA/650/2-75/044
Contract EPA-68-02-1324

Descriptors: *Solid waste disposal, *Refuse disposal, *Electric power generation, *Fuels, Missouri, Utilization, Reclamation, Materials recovery, Iron, Steels, Metal scrap, Boilers, Combustion, Classifiers, Separation, Air pollution, Water pollution, Process charting, Heat recovery, Shredding, Size screening, Earth fills, Cyclone separators, Tables(Data), Performance evaluation, Tests.
Identifiers: Fuel substitutes, St. Louis(Missouri), Energy consumption, Waste recycling, Sanitary landfills.

The St. Louis Union Electric System is the first demonstration plant in the U.S. to process raw municipal waste for use as a supplementary fuel in power plant boilers. In addition to producing a fuel, ferrous metals are recovered from the waste for use as a scrap charge in steel production. Two separate facilities comprise the system--a processing plant operated by the City of St. Louis, and two identical boilers (tangentially fired), which were modified to fire shredded air classified refuse along with coal at the Union Electric Company's Meramec Plant near St. Louis. EPA contracted with MRI to conduct a test and evaluation program. This program includes equipment and facilities evaluations and environmental assessments at both the refuse processing plant operated by the City of St. Louis and the refuse firing facility operated by Union Electric Company's Meramec Plant. This interim report presents (a) test methodology, (b) equipment and facilities evaluation, and (c) environmental evaluations.

PB-243 650/9GA PC$4.25/MF$2.25
Illinois Univ., Chicago. Coll. of Engineering.
Design for the Handicapped in Elevated Transportation Systems.
Research rept.,
Michael S. Gelick, and Marshall L. Silver. Jan 75, 68p* RR-11 UMTA-IL-11-0024-75-1

Descriptors: *Urban transportation, *Rapid transit railways, *Handicapped workers, Escalators, Doors, Design standards, Platforms, Transit stations, Transportation planning, Urban areas, Transportation problems, Transportation terminals.
Identifiers: *Physically handicapped persons, Howard Street transit line, Chicago(Illinois), DOT/5H, DOT/1A.

The report is concerned with the mobility of the physically disabled within urban areas. It identifies architectural barriers faced by the handicapped in relation to rapid transit, establishes design standards, and shows ways these standards may be incorporated in prototypical and existing stations. An evaluation of the Howard Street line of the Chicago Transit Authority (CTA) is presented. Design standards are established to aid designers in making elevated tranportation systems accessible to the handicapped. Various architectural elements, including doors, entry and exit controls, stairs and elevators are diagrammed and discussed. The design standards established are for minimal tolerances and may be exceeded wherever it is felt necessary. The two basic types of platforms presently being used in rapid transit systems, the mid platform and the split platform, are analyzed with particular interest to providing access to the handicapped. Representative station types presently used are explained by diagrams and text.

PB-243 661/6GA
Mag Tape $97.50;Foreign $122.50
Environmental Protection Agency, Washington, D.C. Oil and Special Materials Control Div.
Oil and Hazardous Materials Spill Information Retrieval System (OHM-SIRS), 1 Jul 72-31 Dec 74.
Data file,
Richard E. Hess, and Jean H. Wright. 31 Dec 74, 1 reel mag tape EPA/DF-75/001
Available only in 9 track, 1600 bpi, odd parity, EBCDIC. Price includes User's Manual, PB-243 662.

Descriptors: *Data file, *Water pollution, Oils, Hazardous materials, Magnetic tapes.
Identifiers: *Oil pollution, *Oil spills.

Each of the 10,600 records contains data in up to 29 fields. Included are: Name of material spilled; Location and date of spill occurrence; Quantity spilled and quantity entering water; Source of spill; Cause of spill; Damages caused by spill; Actions taken and by whom; and, Comments.

PB-243 662/4GA PC$3.25/MF$2.25
Environmental Protection Agency, Washington, D.C. Oil and Special Materials Control Div.
Oil and Hazardous Materials Spill Information Retrieval System. User's Manual. (OHM-SIRS)
Apr 75, 17p EPA/DF-75/001a
For data file on magnetic tape, see PB-243 661.

Descriptors: *Publication, *Water pollution, Oils, Hazardous materials, Management planning, Accidents.
Identifiers: *Oil pollution, *Oil spills.

This manual is designed to provide guidance to those who prepare reports on spill episodes to the Division of Oil and Special Materials Control, and who expect to access the system for developing Regional analytical studies. The increasing number of spills reports and the need for more accurate statistical analysis of episodes, make it imperative that Regions report promptly and in accordance with this manual in order that data are available to the Congress, EPA top management, the Office of Management and Budget, and the Public. Even more important is the need for a capability to fully support the Spill Prevention Program and assess its effectiveness.

PB-243 667/3GA PC$3.75/MF$2.25
Virginia Research, Inc., Arlington.
Today's R and D Building a Base for Better Transportation.
Final rept.
15 Apr 75, 46p DOT/TST-75/111
Contract DOT-OS-50101

Descriptors: *Transportation planning, *Research and development, Project planning, Urban transportation systems, Passenger transportation, Cargo transportation.
Identifiers: DOT/3B, DOT/1A.

The report presents a concept of a strategic R and D plan for the Department of Transportation. It also presents the concept of a core program of R and D and sets forth the DOT core program in its present stage of development. The plan shows the relationship within the DOT between socio-economic R and D and R and D in the areas of engineering and in the physical, technical, and life sciences, and presents scenarios for the time frame circa 2000 A.D. for transportation systems for urban passenger, intercity passenger, and freight. Against this background, ongoing R and D programs are described as practical examples of the foregoing conceptual structure. The strategic R and D plan is presented as one with the flexibility to be changed with changing socio-economic patterns, political situations, and break-throughs in the fields of science and engineering.

PB-243 695/4GA PC$3.25/MF$2.25
National Environmental Research Center, Research Triangle Park, N.C. Chemistry and Physics Lab.
Ambient Air Measurements of Vinyl Chloride in the Niagara Falls Area.
Environmental monitoring series,
Bruce W. Gay, Jr., and Richard C. Noonan. May 75, 19p EPA/650/4-75/020

Descriptors: *Air pollution, *Vinyl chloride, *Chemical plants, New York, Angiosarcomas, Chlorine organic compounds, Halohydrocarbons, Aluminum, Buildings, Corrosion, Sampling, Public health.
Identifiers: Air quality, Niagara Falls(New York), *Air pollution sampling, Air pollution effects(Materials), Air pollution effects(Humans).

A 6-day survey was conducted in the Niagara Falls area to determine the concentration of vinyl chloride in the atmosphere. Samples were obtained in a residential area adjacent to the chemical plants where vinyl chloride emissions were suspected, in areas around the plants, and in other areas of Niagara Falls. The highest concentration of vinyl chloride measured was 40 ppb for a 5-hour integrated sample observed at a residential area two blocks east of a vinyl chloride polymerization plant. Grab samples taken downwind of chemical plants exhibited a high of 28 ppb. Samples taken from downtown Niagara Falls and upwind north of the chemical plants contained no detectable vinyl chloride. The areas surrounding the chemical plants, including the adjacent residential areas, are also affected by emissions into the atmosphere of chlorine and other halogenated compounds as exhibited by the deterioration of metal surfaces, particularly aluminum windows and doors.

PB-243 697/0GA PC$3.75/MF$2.25
Lake Tahoe Area Research Coordination Board, South Lake Tahoe, Calif.
Research Coordination and Utilization, The Tahoe Basin: 1974 Annual Report of the Lake Tahoe Area Research Coordination Board.
Annual rept. Jan-Dec 74.
1974, 40p NSF/RA/G-74/031
Grant NSF-GT-39556

Descriptors: *Regional planning, *Lake Tahoe Basin, Project planning, Research needs, Inventories, Data processing, Technical reports, Grants, Information systems, Objectives, California.

The report on the first year activities of the Research Coordination Board and its staff unit, provides background information on how the need for a coordinated research effort in the Lake Tahoe Basin led to the scope and organization of the current project. It discusses the primary activities of the project, which have centered on: (a) An inventory of past and current research in the Tahoe Basin; (b) establishment of an effective coordination mechanism to keep various research groups apprised of others' work, and to encourage and facilitate needed research; (c) a list of research needs of the Tahoe Basin; and (d) provision of an information system to disseminate research results to users. The research coordination project action plan is included as an appendix. Conferences, meetings, seminars, and publications resulting from the first year's activity are also listed.

PB-243 722/6GA PC$7.00/MF$2.25
Utah Water Research Lab., Logan.
The Effects of Artificial Destratification on the Water Quality and Microbial Populations of Hyrum Reservoir,
Douglas D. Drury, Donald B. Porcella, and Robert A. Gearheart. Jun 75, 182p PRJEW011-1 W75-09897, OWRT-A-020-UTAH(1)
Contract DI-14-31-0001-4045

Descriptors: *Aeration, *Stratification, *Hyrum Reservoir, Thermoclines, Dissolved gases, Oxygen, Nutrients, Trout, Water quality, Nitrogen cycle, Runoff, Suspended sediments, Coliform bacteria, Hydraulics, Aquatic microbiology, Seasonal variations, Little Beaver River, Utah, Theses.
Identifiers: *Dissolved oxygen, *Destratification, Aphanizomenon, *Water quality data, Epilimnion, Eutrophication.

Hyrum Reservoir, Utah, was studied for one year and then for a year following the initiation of artificial destratification. The redistribution of dissolved oxygen to the lower depths of the reservoir significantly increased the amount of habitat suitable for trout. The annual Aphanizomenon bloom increased during the first year after initiating destratification. The nitrogen cycle and the vertical distribution of bacteria were altered as a result of the elimination of the thermocline. During destratification the total suspended solids were correlated with the total coliforms. The water quality of Hyrum Reservoir was highly affected by annual runoff, spring and fall overturns, and destratification; sediments, the increased Aphanizomenon bloom, higher epilimnetic nutrient concentrations, more uniform microbial and nutrient distributions all resulted from these hydraulic factors working singly and in combination.

PB-243 724/2GA PC$7.50/MF$2.25
California Univ., Santa Barbara. Marine Science Inst.
Oil Spill and Oil Pollution Reports, February 1975-April 1975.
Quarterly rept. Feb-Apr 75,
Floyd A. DeWitt, Jr., and Penelope Melvin. Jun 75, 248p* EPA/670/2-75/059
Contract EPA-R-803063
See also PB-242 542.
Paper copy also available from GPO.

Descriptors: *Oils, *Water pollution, *Bibliographies, Reviews, Detection, Sampling, Remote sensing, Water analysis, Cleaning, Research projects, Patents, Regulations, Legislation, Geophysical prospecting, Biodeterioration, Ecology, Design, Materials handling, Containment, Accidents.
Identifiers: *Oil pollution, *Oil spills, Oil pollution control, Water pollution detection, Oil pollution removal, Water pollution effects(Health), Water pollution effects(Materials).

This report is the third quarterly compilation of oil spill events and oil pollution report summaries. Presented in the report are: (a) summaries of oil spill events; (b) summaries and bibliographic literature citations; (c) summaries of current research projects; and (d) patent summaries.

PB-243 739/0GA PC$4.75/MF$2.25
Geological Survey, Indianapolis, Ind. Water Resources Div.
A River-Quality Assessment of the Upper White River, Indiana.
Final rept.,
William J. Shampine. Jun 75, 76p USGS/WRI-10-75, USGS/WRD-75/043

Descriptors: *Water pollution, *White River, Rural areas, Surveys, Inorganic phosphates, Inorganic nitrates, Bioassay, Primary biological productivity, Chemical properties, Urban areas, Sewage treatment, Water quality, Drainage, Nutrients, Sources, Tables(Data), Industrial waste treatment, Indiana.
Identifiers: Eutrophication, *Water quality data, Winchester(Indiana), Muncie(Indiana), Anderson(Indiana), Indianapolis(Indiana), Local studies.

The White River can be subdivided into five distinct river-quality sections Section 1, the rural area above Winchester, is affected by agricultural land use although the river quality generally is good. Section 2, between Winchester and Muncie, is affected by urbanization at Winchester and Muncie. The river quality generally is good, except occasionally near the cities. Section 3, Muncie to Anderson, receives waste discharges from urban areas resulting in a poorer river quality than that found in upstream reaches of the river. In Section 4, Anderson to Indianapolis, the river continues to receive waste discharges common to urban areas. The river quality in this section generally is poor in the upstream reach and relatively good in the downstream reach. In Section 5, below Indianapolis, the river receives large amounts of waste discharges. The river quality is very poor beyond the project area.

PB-243 744/0GA PC$6.25/MF$2.25
Minnesota Univ., Minneapolis. St. Anthony Falls Hydraulic Lab.
Flow Establishment and Initial Entrainment of Heated Water Surface Jets.
Ecological research series (Final),
Heinz Stefan, Loren Bergstedt, and Edward Mrosla. May 75, 153p EPA/660/3-75/014
Grant EPA-R-800435

Descriptors: *Thermal pollution, *Jet mixing flow, *Cooling water, Entrainment, Water quality, Mathematical models, Outfall sewers, Dilution, Temperature gradients, Patterns, Froude

number, Predictions, Surface waters, Flow measurement, Velocity measurement, Buoyancy, Plumes, Test methods.
Identifiers: *Water pollution abatement.

Mathematical modeling of the zone of flow (re-)establishment (ZFE) of heated water surface jets has been found to be difficult because of the complex dependence on outlet geometry, discharge velocity, buoyancy, and ambient currents. Laboratory experiments have therefore been conducted to provide more observations and data on flow patterns, temperatures, and flow velocities in the ZFE and some distance beyond. The relationships provided can be used to make more accurate temperature predictions in the immediate vicinity of a heated water surface channel.

PB-243 773/9GA PC$3.75/MF$2.25
Massachusetts Univ., Amherst. Dept. of Food and Nutrition.
Applications of Integer and Quadratic Programming to Floodplain Land Use Management,
J. L. Kaul, and C. E. Willis. 17 Oct 74, 39p W75-10008, OWRT-B-043-MASS(1)
Contract DI-14-31-000-3896
Presented at the Annual Meeting of the Operations Research Society, San Juan, 17 Oct 74.

Descriptors: *Flood plains, *Flood control, *Management methods, Flood plain zoning, River basins, Decision making, Nonlinear programming, Stochastic processes, Risk, Connecticut River Basin.
Identifiers: Integer programming, Quadratic programming.

Methodologies useful to planners at several levels for efficiently managing floodplains using both structural and non-structural measures are provided. The usefulness of these frameworks is demonstrated by applying them to a selected floodplain in the Connecticut River Basin. The algorithms for solving these two decision frameworks employ, respectively, integer and quadratic programming procedures. These frameworks enable the formulation of far more realistic and interesting situations than either of the only two previous applications of operations research methods (both linear programming applications). Major advantages of these two frameworks are that they are cast in a stochastic rather than a deterministic mode (hence enabling the capture of important effects of risk and uncertainty) and presume the demand for land in various uses to be price flexible. The decision framework considers floodplain zoning, flood proofing, and other structural alternatives as well as enabling the incorporation of external effects of floodplain development on communities upstream and downstream.

PB-243 779/6GA PC$3.75/MF$2.25
Mississippi State Univ., Mississippi State. Water Resources Research Inst.
Residential Canals Along the Gulf Coast.
Completion rept.,
Oscar L. Paulson, Jr., and George F. Pessoney. Jul 75, 45p W75-10016, OWRT-A-088-MISS(1)

Descriptors: *Water quality, *Canals, *Gulf Coast(United States), Houses, Comparative studies, Temperature measurement, Salinity, Conductivity, Coliform bacteria, pH, Biochemical oxygen demand, Oxygen, Bathymetry, Tides, Environmental issues, Velocity, Dyes, Mississippi, Flushing, Water pollution.
Identifiers: *Residential canals, Saint Louis Bay(Mississippi).

A study of a residential canal system on the Mississippi Gulf Coast and adjacent natural water bodies was conducted to determine the relationship in flushing characteristics between man-made and natural systems. The comparison was based on measurements of temperature, salinity, conductivity, coliform, pH, transparency, biological oxidation demand, dissolved oxygen, bathymetry, tides, water velocity, and Rhodamine dye concentrations. The results indicate that coliforms increase with increasing distance of stations from the receiving water body, St. Louis Bay, and dissolved oxygen decreases in a similar manner. Other findings are also discussed.

PB-243 811/7GA PC$5.25/MF$2.25
Environmental Protection Agency, Seattle, Wash. Region X.
Relationship of Effluent Limitations to Future Pulp Mill Closures,
Robert L. Coughlin. Dec 72, 101p Working paper 88

Descriptors: *Pulp mills, *Paper industry, *Water pollution control, *Economic impacts, Industrial waste treatment, Economic analysis, Standards, Legislation, Regulations, Effluents, Cost estimates.
Identifiers: Pacific Northwest Region(United States).

Section 302 (b) of the Federal Water Pollution Control Act of 1972 stipulates that under some circumstances the economic and social costs of achieving effluent limitations shall be taken into account in determining the nature of such limitations. This study is an effort to draw that economic context for the Pacific Northwest woodpulp industry that is generally conceded to be most significant to water pollution in Federal Administrative Region X. It is pointed to the solution of a single problem, determining the impact of waste treatment on production costs of the Region's pulp mills, and relating it to fundamental industry dynamics in order to forecast the likelihood of plant closures. Hopefully, this technical exercise will assist those who may be forced to determine the relative economic and social costs of setting particular effluent limitations.

PB-243 841/4GA PC$8.75/MF$2.25
Battelle Columbus Labs., Ohio.
Environmental Assessment of the System Plan.
Final rept.
30 Apr 75, 286p USRA/R-092
Contract USRA-50039

Descriptors: *Rapid transit railways, *Passenger transportation, *Northeast Region(United States), *Transportation planning, *Environmental aspects, Land use, Air pollution, Water quality, Noise reduction, Fuel consumption, Environmental surveys, Rail transportation.
Identifiers: Conrail System.

The report reviews environmental factors associated with railroad operations. An environmental assessment was made for five major environmental sectors: air quality, noise, land use, energy, and water quality. The generic problems considered under these sectors were abandonment, reduced and increased service, electrification, rehabilitation, and expansion. The study analyzes the changes likely to be brought about by implementation of the System Plan for Conrail. It recommends that the study be used to produce a set of guidelines for use in railway planning.

PB-243 845/5GA PC$5.75/MF$2.25
Kearney (A. T.), Inc., New York.
Highway Subsidiaries Study.
3 Jul 75, 135p USRA/R-060
Contract USRS-50117

Descriptors: *Rail transportation, *Cargo transportation, *Highway transportation, Trucking industry, Interviews, Services, Piggyback, Coordination, Management.
Identifiers: Intermodal cargo transportation, Conrail System, Pennsylvania Truck Lines, Reading Transportation Company.

The report studies Conrail Corporation's trucking requirements and its growth opportunities in truck transportation. The operations of two highway subsidiaries Pennsylvania Truck Lines (PTL) owned by Penn Central Transportation Company and the Reading Transportation Company (RTC) owned by Reading Company were evaluated through use of interviews of key personnel, observation of facilities, and review of financial and operational performance. It recommends that CRC acquire PTL and RTC, enter the less than truckload market in the New York to Chicago lane, retrieve, if possible, New England Transportation, and undertake studies to blend truck-rail management.

PB-243 880/2GA PC$3.25/MF$2.25
North Carolina Univ., Chapel Hill. Center for Urban and Regional Studies.
The Effects of Authorization for Water Impoundments on Shoreland Transition.
Completion rept.,
Shirley F. Weiss, Raymond J. Burby, III, and Thomas G. Donnelly. 1971, 16p W75-10126, OWRT-B-025-NC(1)
See also PB-213 814.

Descriptors: *Reservoirs, *Regional economy, *Economic forecasting, Shores, Land development, Social change, Urbanization, North Carolina, Property values, Land use, Policies, State government, Local government, Regional planning, Sites, Exploitation, Economic effects, Factor analysis.
Identifiers: Impoundments.

Objectives were to: (1) Identify and evaluate factors which explain the location of land transactions, changes in land prices or value, and changes in land use patterns which occur after the authorization of water impoundments; (2) develop and test a model to predict short-term changes in land ownership, land value, and land utilization; (3) develop a system for monitoring changes in land values, land use, and predictive factors utilized in the transition model as they occur in reservoir areas; (4) prepare policy guides to enable the Corps of Engineers and state and local governmental agencies to prevent the exploitation of land in authorized reservoir areas and to facilitate desirable development to meet public land use objectives.

PB-243 887/7GA PC$3.75/MF$2.25
Clemson Univ., S.C. Dept. of Civil Engineering.
Utilization of Aerial Photographs for Measuring Land Use Changes in Watersheds,
Donald B. Stafford, James T. Ligon, and M. Eugene Nettles. 1973, 27p W75-10136, OWRT-A-024-SC(3)
Presented at the Internationsl Symposium on Remote Sensing of Water Resources, Held at Burlington, Ontario, Canada, on June 11-14, 1973.

Descriptors: *Land use, *Watersheds, *Urban areas, Aerial photographs, Land planning, Runoff, Classifications, Measurement, Photographic techniques, Meetings, South Carolina.

Techniques are described for using existing aerial photographs to investigate land use changes in watersheds. A primary objective was to measure the physical characteristics of historical land use patterns that affect the hydrologic parameters of a watershed. Land use changes in two watersheds in western South Carolina were examined. One of the watersheds has experienced rapid urbanization in recent years and the other watershed has experienced significant changes in agricultural land use over the past 26 years. Existing aerial photographs taken at approximately five-year

intervals were used to delineate, classify, code, and measure the areas of various land use classes in the two watersheds. The land use classes employed were those that had experienced significant changes and which had different runoff characteristics. The area occupied by each land use class was measured on photographic enlargements by using a planimeter. Significant changes in land use were observed in the two watersheds.

PB-243 892/7GA PC$11.25/MF$2.25
Environmental Protection Agency, Washington, D.C. Office of Research and Development.
Projects in the Industrial Pollution Control Division: December 1974.
Environmental Protection technology series.
Mar 75, 449p* EPA-600/2-75-001

Descriptors: *Water pollution control, *Industrial waste treatment, *Federal programs, Projects, Surveys, Objectives, Statistical data, Descriptions, Research.

The document is a compilation of information sheets from industrial pollution control projects initiated since fiscal year 1967 through fiscal year 1974. Each sheet contains the objectives, statistical information, and a brief description of the particular project. General introductory information on the Federal industrial pollution control program is also presented to provide perspective on the magnitude of industrial pollution and the research directions that must be pursued in order to develop the technology to adequately control this largest point source of pollution in the United States.

PB-243 906/5GA PC$7.00/MF$2.25
Little (Arthur D.), Inc., Cambridge.
Economic Analysis of Effluent Guidelines: Textiles Industry.
Final rept.,
Daniel Hefler. Jun 75, 180p* ADL-C-75937-FR
EPA/230/2-75/028
Contract EPA-68-01-1541

Descriptors: *Water pollution economics, *Economic impacts, Water pollution standards, Cost estimates, Water pollution standards, Water pollution abatement, Financing, Prices, Technology, Competition, Profits, Employment, Communities, Shutdowns, Industrial plants, Dyeing, Textile finishing, *Textile industry.
Identifiers: Industrial shutdowns, SIC 221, SIC 224, Best technology.

An analysis of the economic impact of proposed water effluent guidelines upon the textile industry (SIC 221 to 224) was performed based on abatement technology as described in EPA-440/1-74-0222. Development Document for Effluent Guidelines and New Source Performance Standards of the Textile Mills Point Source Category, June 1974, and aimed at estimating mill closings rather than total industry costs. The impact was evaluated for implementation of best practicable control technology and best available control technology. Connection to municipal systems creates minimum impact. Self-treatment under best practicable treatment and best available treatment (BAT) also produces minimal impact in terms of mill closings.

PB-243 991/7GA PC$11.25/MF$2.25
Environmental Protection Agency, Seattle, Wash. Region X.
Auburn Interceptor (Green River Sewerage Area) King County, Washington.
Final environmental impact statement.
13 Jun 75, 443p EPA/910/9-75/009

Descriptors: *Environmental impact statements, *Sewers, *Construction, Regional planning, Municipalities, Green River Basin, Waste water, Land use, Urban planning, Waste treatment, Right of way acquisition, Pipelines, Washington(State).
Identifiers: Seattle(Washington), King County(Washington).

The action for this Environmental Impact Statement is the awarding of grant funds to the Municipality of Metropolitan Seattle (Metro) for the construction of an interceptor sewer line in King County, Washington to service the Green River Sewerage Area. The project would result in the elimination of the discharge, to the Green River, of inadequately treated wastewaters from the City of Auburn lagoon system and would be a segment in the extension of a regional wastewater collection system providing for (1) the elimination of wastewater discharges to the Green River and its tributaries; (2) discontinuance of use of septic tanks in unsuitable soils in the Green River Sewerage Area; and (3) the removal of the constraint on growth and development represented by a lack of adequate sewer service. Major adverse primary impacts and mitigative measures are: The construction corridor passes through easterly margin of one small area identified as a permanent wetland. Mitigation of the impact on this area could be provided. Wastewaters intercepted by the project would be treated at Metro's existing secondary treatment plant at Renton. No adverse impacts are anticipated on archaeological, historical or cultural resources.

PB-244 066/7GA PC$4.75/MF$2.25
Bechtel Inc., Gaithersburg, Md.
Northeast Corridor High Speed Rail Passenger Service Improvement Project. Task 6. Risk Analysis of Joint Passenger/Freight Operations.
Final rept.
Aug 75, 99p FRA/ONECD-75/6
Contract DOT-FR-40027
Prepared in cooperation with Battelle-Columbus Labs., Ohio. See also PB-243 419.

Descriptors: *Rapid transit railways, *Passenger transportation, *Northeast Region(United States), *Transportation planning, Risk analysis, Freight services, Cargo transportation, Rail transportation, Estimates, Hazards.
Identifiers: DOT/2C, DOT/1B, Commuter rail systems.

The objective of Task 6 was the assessment of the risk associated with the operation of a Northeast Corridor passenger system in the proximity of through and local freight. The report identifies two major categories of passenger/freight interaction and contains analyses of these factors as they apply to the various operational scenarios under consideration for the 1990 High Speed Rail Plan.

PB-244 088/1GA PC$4.75/MF$2.25
Metropolitan Transportation Commission, Berkeley, Calif.
Exploratory Network Analyses of BART's Impacts Upon Accessibility.
Working paper,
Henry S. L. Fan, and Alistair Sherret. Jul 75, 93p
WP-15-3-75
Contract DOT-OS-301-76
Prepared in cooperation with Peat, Marwick, Mitchell, and Co.

Descriptors: *Rapid transit railways, *Urban transit systems, California, Travel patterns, Transit fares, Central city, Shopping centers, Industrial parks, Employment centers, Traffic peaks, Availability, Services.
Identifiers: BART(Bay Area Rapid Transit), Bay area rapid transit, San Francisco(California), DOT/5F, DOT/1B.

The objective of the study was to (1) make a preliminary assessment of BART's impacts on areawide accessibility, and (2) evaluate the use of network-based accessibility measures as an impact analysis technique. Accessibility measures were based on estimates of zone-to-zone travel times and transit fares derived from networks developed for the 1971 'pre-BART' and 1976 'post-BART' highway and transit systems. The accessibility measures were expressed as simple indices, weighted by the size and characteristics of the resident population in the origin zone. Comparisons of the accessibility indices were made for both peak and off-peak travel times for selected destination zones in the BART service area. The selected zones represent the locations of important employment centers, shopping facilities, and hospitals. Assessments were made of BART's potential accessibility impacts on the racial minority, elderly, and low-income populations as well as the generation population.

PB-244 107/9GA PC$4.25/MF$2.25
Water Resources Engineers, Inc., Springfield, Va.
Impact of Economic Risks on Box Culvert Designs--on Application to 22 Virginia Sites.
Final rept.,
G. K. Young, and M. R. Childrey. Aug 74, 52p
FHWA/RD-75-49
Contract DOT-FH-11-7669

Descriptors: *Culverts, *Economic risks, *Design criteria, *Cost engineering, Flood predictions, Risk analysis, Construction costs, Flood control, Soil erosion, Hydraulic engineering, Virginia.
Identifiers: DOT/5G, DOT/4CZ/CD.

The report demonstrates the results of a preliminary effort to incorporate economic risks into culvert design and to relate this economic design to conventional design practice for 22 culvert sites in Virginia. Economic design is defined as the minimum annual construction cost plus the expected flood-related loss or risk. Each design is evaluated in a five-step procedure: (1) calculate annual construction cost, (2) perform dynamic flow routings for a series of flood hydrographs, (3) estimate embankment erosion, (4) calculate losses with flood probabilities to derive risks.

PB-244 118/6GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 1. Railroad Car Movement Reliability: A Preliminary Study of Line-Haul Operations.
Final rept.,
A. S. Lang, and R. M. Reid. Oct 70, 33p MIT-R70-74
See also Volume 2, PB-244 119. Prepared in cooperation with Federal Railroad Administration, Washington, D.C., Union Pacific Railroad Foundation, Omaha, Nebr., and Burlington Northern Railroad, St. Paul, Minn.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Railroad cars, Failure, Mechanical engineering, Brakes(Motion arresters), Delay time, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

Data on road train delays due to various tyes of mechanical failures and derailments and on the duration of these delays were collected for a total of 1,065 trains operating over a single main-line division during a two-month period. These delays were classified by major type (brake, coupler, and other types of failures-not including engine failures) and by possible causal factors (train length, trailing tonnage, and track profile) operative at the time of the failure.

PB-244 119/4GA PC$5.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.

Studies in Railroad Operations and Economics. Volume 2. Rail Trip Time Reliability: Evaluation of Performance Measures and Analysis of Trip Time Data.
Final rept.,
Carl D. Martland. Jun 72, 110p MIT-R72-37
FRA/RPD-75/1.1
Contract DOT-FR-10006
See also Volume 1, PB-244 118, and Volume 3, PB-244 120.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Railroad terminals, Delay times, Railroad cars, Freight shippers, Economic factors, Cargo transportation, Railroads.
Identifiers: DOT/2C, DOT/2G.

After evauating alternative measures within a logistics framework, this report recommends two measures of reliability, the maximum percentage of cars whose trip times fall in a consecutive two or three day period of the trip time distribution (the 2- or 3-day%) and the percentage of cars arriving after this period (the %-late). Nevertheless, a dialogue with shippers is necessary before the most appropriate measures can be determined for a specific situation. Using these measures, origin-to-destination (O-D) data for three railroads are analyzed to discover the nature of O-D reliability. Although yard classifications are found to affect reliability much more than does distance, detailed train information is necessary to predict the nature of this impact for a particular O-D pair. Reducing the number of classifications or improving yard operations will improve both reliability and mean trip times.

PB-244 120/2GA PC$4.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 3. Determinants of Line Haul Reliability.
Final rept.,
Kenneth Belovarac, and James T. Kneafsey. Jun 72, 97p MIT-R72-38 FRA/RPD-75/1.2
Contract DOT-FR-10006
See also Volume 2, PB-244 119, and Volume 4, PB-244 121.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Railroad trains, Scheduling, Railroad terminals, Economic factors, Cargo transportation, Railroads.
Identifiers: DOT/2C, DOT/2G.

The authors look in detail at the variance in arrival time and its components for a total of 1197 trains operating over three different runs (of a single railroad) varying from 150 to 270 miles in length. Their data showed standard deviations of arrival times which typically ranged from 1 to 3-1/2 hours for trains operating on a half dozen different schedules. More important, the analysis of their data showed that the variability in departure time, in running time (excluding stops and delays), and in intermediate yard time were the major contributors to arrival time variance. Standard deviations of departure times (from initial terminal) were on the order of 45 minutes to 1-1/2 hours, of running times from 45 minutes to 2-1/2 hours, and of intermediate yard times from 1/2 hour to 1 hour.

PB-244 121/0GA PC$4.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 4. The Impact of Classification Yard Performance on Rail Trip Time Reliability.
Final rept.,
Robert M. Reid, John D. O'Doherty, Joseph M. Sussman, and A. Scheffer Lang. Jun 72, 72p MIT-R72-39 FRA/RPD-75/1.3
Contract DOT-FR-10006
See also Volume 3, PB-244 120, and Volume 5, PB-244 122.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Railroad terminals, Delay time, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

Yard reliability emerges as a problem of central importance to overall movement reliability. Detailed studies of three yards suggest that 10 to 20% of all cars miss their most appropriate outbound train connections, although performance varies not only between yards, but between inbound-outbound train pairs at the same yard. It is possible to express the probability of making a connection as an increasing function of the time available to make the connection, since the extra time offsets both arrival delays and congestion delays. The greatest cause of delay, however, is the cancellation of outbound trains or blocks. Extraordinary delays caused by rips and no-bills appear to be a relatively small problem.

PB-244 122/8GA PC$7.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 5. Models for Investigating Rail Trip Time Reliability.
Final rept.,
Joseph F. Folk. Jun 72, 213p MIT-R72-40
FRA/RPD-75/1.4
Contract DOT-FR-10006
See also Volume 4, PB-244 121, and Volume 6, PB-244 123.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Delay time, Mathematical models, Rail freight traffic, Railroad cars, Railroad terminals, Economic factors, Railroads, Cargo transportation, Policies.
Identifiers: DOT/2C, DOT/2G.

The unreliability of the trip time of railroad freight shipments is often given as the reason for the railroads' loss of traffic to competing modes of transport. The report investigates various operating policies and practices affecting reliability through the use of two simulation models. A network model is developed which simulates the day-to-day movements of cars through a portion of rail network, while another model simulates the journey of a single car moving through a series of yards. The objectives of these models are similar; namely, to study the network effects on reliability of operating policies such as (a) holding outbound trains for more traffic, (b) cancelling outbound trains, (c) altering scheduled connection times at yards, and (d) running shorter more frequent trains between yards. Major conclusions are that railroad operating policies do have a substantial effect on car movement reliability.

PB-244 123/6GA PC$4.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 6. Some Analyses of Railroad Data.
Final rept.,
Joseph F. Folk. Jun 72, 78p MIT-R72-41
FRA/RPD-75/1.5
Contract DOT-FR-10006
See also Volume 5, PB-244 122, and Volume 7, PB-244 124.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Rail freight traffic, Railroad terminals, Scheduling, Mathematical models, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

The report presents data from several railroads on yard, link, and total origin-to-destination performance. Topics analyzed include train arrivals as functions of train length and the day of the week, line haul times, departure times, receiving yard delays, total yard times, missed connections, and trip time standard deviations. Such data analysis is necessary to insure a realistic choice of parameter values and modelling concepts in conjunction with the simulation models discussed in Volume 5, Models for Investigating Rail Trip Time Reliability. The data and results given in this report can also be helpful to future work on railroad reliability.

PB-244 124/4GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 7. A Brief Review of Various Network Models.
Final rept.,
Joseph F. Folk. Jun 72, 38p MIT-R72-42
FRA/RPD-75/1.6
Contract DOT-FR-10006
See also Volume 6, PB-244 123, and Volume 8, PB-244 125.

Descriptors: *Rail transportation, *Freight forwarding, Reliability, Mathematical models, Rail freight traffic, Railroad cars, Scheduling, Policies, Optimization, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

In the past decade, the railroad industry has developed various types of models to investigate different operating problems and policies, as well as proposed changes in the physical plant of a railroad. This report presents a review of the railroad network models. Two basic types of network models are reviewed: simulation models and optimization models. In the network simulation models reviewed, car movements through a network are simulated for a fixed set of train schedules and route structures. Changes in operating policies are tested by making appropriate changes in either the input data deck or the internal logic of the simulation program. The network optimization models reviewed optimize train schedules (or in one case, a railroad network) for a fixed traffic demand. Quantities one might vary in a optimization model include traffic levels, network configuration, cost indexes, and parameters such as train speeds and processing rates at yards.

PB-244 125/1GA PC$4.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 8. Reliability in Railroad Operations.
Final rept.,
A. Scheffer Lang, and Carl D. Martland. Oct 72, 96p MIT-R72-74 FRA/RPD-75/1.7
Contract DOT-FR-10006
See also Volume 7, PB-244 124, and Volume 9, PB-244 126.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Rail freight traffic, Delay time, Railroad terminals, Scheduling, Management, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

Line-haul and trip time data were analyzed from eight railroads and found that unreliability is evident in all phases of rail operations. Yard delays, many of which are caused by unreliable train operations, are the greatest cause of trip time unreliability. Changes in operations, capital improvements, and institutional changes can all help improve reliability. Moreover, capital investment especially in im-

proved mechanical reliability of equipment, will have a less significant and immediate impact than operating changes such as through-blocked trains and increased schedule adherence. A dialogue between shippers, railroads, labor, and management is critical to the success of a program for improving reliability.

PB-244 126/9GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 9. Reliability in Railroad Operations: Executive Summary.
Final rept.,
Joseph M. Sussman, Carl D. Martland, and A. Scheffer Lang. Oct 72, 28p MIT-R73-4
FRA/RPD-75/1.8
Contract DOT-FR-10006
See also Volume 8, PB-244 125, and Volume 10, PB-244 127.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Rail freight traffic, Railroad terminals, Scheduling, Management, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

Line-haul, and trip time data were analyzed from eight railroads and found that unreliability is evident in all phases of rail operations. Yard delays, many of which are caused by unreliable train operations, are the greatest cause of trip time unreliability. Changes in operations, capital improvements, and institutional changes can all help improve reliability. Moreover, capital investment, especially in improved mechanical reliability of equipment, will have a less significant and immediate impact than operating changes such as through-blocked trains and increased schedule adherence. A dialogue between shippers, railroads, labor and management is critical to the success of a program for improving reliability.

PB-244 127/7GA PC$6.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 10. Improving Railroad Reliability: A Case Study of the Southern Railway.
Final rept.,
Carl D. Martland. Mar 74, 167p MIT-R74-28
FRA/RPD-75/1.9
Contract DOT-FR-10006
See also Volume 9, PB-244 126, and Volume 11, PB-244 128.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Rail freight traffic, Railroad terminals, Scheduling, Cost engineering, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

The report serves three major functions: it analyzes O-D yard, and line-haul performance over a large portion of the Southern system; it summarizes a set of procedures for improving reliability on any railroad, and its describes in detail the test program carried out on the Southern. The major product of this research, this test program demonstrated that reliability can be improved in the short run, that this need not initially involve added capital or operating expense and that this will also result in lower trip times. By changing train schedules and operating procedures for three traffic flows, involving 300 cars/day, Southern improved reliability about 15%, reduced trip times by nearly a day, and save approximately $25,000/month in car utilization expense.

PB-244 128/5GA PC$3.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 11. Improving Railroad Reliability: A Case Study of the Southern Railway, Executive Summary.
Final rept.,
Joseph M. Sussman, and Carl D. Martland. Mar 74, 29p MIT-R74-29 FRA/RPD-75/1.10
Contract DOT-FR-10006
See also Volume 10, PB-244 127, and Volume 12, PB-244 129.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Rail freight traffic, Railroad trains, Scheduling, Management, Cost engineering, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

The three goals of this study were to test previous research conclusions, define procedures for improving reliability, and design, implement, and evaluate a test program for improving Southern performance. The report presents the major results and basic conclusions of this research project. The major product of the project was the test program, which demonstrated that reliability can be improved in the short run, that this need not initially involve added capital or operating expense, and that this will also result in lower trip times. By changing train schedules and operating procedures for three traffic flows involving 300 cars/day, Southern improved reliability about 15%, reduced trip times by nearly a day, and saved approximately $25,000/monthly in car utilization expense.

PB-244 129/3GA PC$4.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 12. Procedures for Improving Railroad Reliability.
Final rept.,
Carl D. Martland. Mar 74, 82p MIT-R74-30
FRA/RPD-75/1.11
Contract DOT-FR-10006
See also Volume 11, PB-244 128, and Volume 13, PB-244 130.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Systems analysis, Planning, Problem solving, Recommendations, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

The report defines an experimental procedure with which any railroad can start to improve reliability. The success of the test program implemented by the Southern Railway (See Volume 10) demonstrates that the procedure not only works, but offers potential operating and economic benefits to railroads that adopt it. In addition to describing the basic procedures, this report discusses data processing capabilities alternatives for improving reliability, and methods for evaluating these alternatives. The report closes with recommendations to the government and to the industry for improving railroad reliability.

PB-244 130/1GA PC$4.75/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 13. Costing in Railroad Operations: A Proposed Methodology.
Final rept.,
James T. Kneafsey. Mar 75, 79p MIT-R75-15
FRA/RPD-75/1.12
Contract DOT-FR-10006
See also Volume 12, PB-244 129, and Volume 15, PB-244 131.

Descriptors: *Rail transportation, *Freight forwarding, Reliability, Economic analysis, Cost engineering, Mathematical models, Rail freight traffic, Scheduling, Policies, Economic factors, Railroads, Cargo transportation.
Identifiers: DOT/2C, DOT/2G.

The report identifies, evaluates and recommends criteria for the application of economic analysis in areas relating to data and information requirements in railroad freight operations. The demonstrated need for a more consistent and comprehensive application of this analysis resulted in the accumulation of additional data from which cost functions were estimated which might be used by railroad managements and government agencies as a basis for subsequent policy decisions. This research which was conducted at both interfirm and intrafirm levels of analysis produced a set of models calibrated from selected data encompassed in a matrix which were used to estimate production functions and appropriate long run cost functions. These models hopefully will provide valuable assistance to railroad companies as additional sources of information regarding the cost performance of their operation.

PB-244 131/9GA PC$9.25/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Transportation Systems Div.
Studies in Railroad Operations and Economics. Volume 15. A Model of Rail/Truck Competition in the Intercity Freight Market.
Final rept.,
Brian C. Kullman. Dec 73, 318p MIT-R74-35
FRA/RPD-75/1.14
Contract DOT-FR-10006
See also Volume 13, PB-244 130.

Descriptors: *Rail transportation, *Freight forwarding, *Reliability, Intermodal shipping, Trucking industry, Market profiles, Mathematical models, Regression analysis, Economic factors, Railroads, Cargo transportation, Transportation planning.
Identifiers: DOT/2C, DOT/2G, Modal split models, Logit models.

The report proposes a model based on the logit function to predict the rail and truck market share for specific city pairs and commodity groups. Effort was devoted to the problem of introducing both transport service variables and shipper's logistic variables into the model. The model was calibrated with data from the 1967 Census of Transportation and from various carriers. Significant regressions were obtained from linear logit models once the proper variables were identified. Theoretical monetary values of carriers' services were compared to the empirical values in the model, indicating that shippers pay more for quality service than predicted; this result may be due to bias in the model introduced by use of aggregated and unreliable data. It is concluded that further research using this model form with more disaggregate data could yield significant improvements in results and provide valuable information for public and private transportation planning.

PB-244 165/7GA PC$5.75/MF$2.25
PROD, Inc., Santa Cruz, Calif.
Revitalization of Downtown. Self Help Guidelines for the Smaller City.
Final rept.
Feb 75, 128p*

Descriptors: *Central city, *Urban areas, *Renovating, *Manuals, Urban planning, Housing planning, Housing restoration, Job development, Project planning, Citizen participation, Economic development, California.
Identifiers: *Small cities, Santa Cruz(California), *Small communities.

The manual covers the following areas: (1) History of revitalization efforts in Santa Cruz; (2) a step by step procedure for implementing revitalization projects; (3) housing rehabilitation and job training; (4) a significant bibliography and appendices covering 'how to'

references and other resources related to revitalization and planning matters.

PB-244 239/0GA PC$7.00/MF$2.25
Rocky Mountain Center on Environment, Denver, Colo.
A Land Use Decision Methodology for Environmental Control.
Final rept.,
Kirk Wickersham, Roger P. Hansen, and Albert G. Melcher. Mar 75, 188p* EPA/600/5-75-008
Contract R802423

Descriptors: *Land use, *Local government, *Management planning, *Environmental issues, Ecology, Public opinion, Community development, Citizen participation, Water resources, Zoning, Regulations, Environmental aspects.

The report proposes an ecologically responsible land use decision-making system for local, regional and, to an extent, state governments. Referred to as LUDMS, it is based on conclusions that local governments have not dealt effectively with land use problems because traditional planning and land use control devices are unecological, unresponsive and unsystematic. The fundamental premise of LUDMS is that environmentally responsible land use planning and control must be based on valid ecological information combined with enlightened and informed public opinion. LUDMS makes use of several basic concepts, including policy planning (a process for combining public opinion with scientific and technical information to create community policies); use of an interdisciplinary team; public participation; an environmental resources inventory and analysis; a staff which understands and can communicate about ecology; legal devices for land use control; and positive community programs. 'Model' state and local codes for implementing LUDMS are provided.

Y-DA-6106 PC$4.75/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Biological Denitrification of Nitrate Waste Solutions.
F. E. Clark, H. C. Francke, and J. W. Strohecker. 1975, 35p CONF-750524-1
Contract W-7405-eng-26

Descriptors: (*Liquid wastes, *Denitration), (*Nitric acid, *Recovery), (*Aluminium nitrates, *Crystallization), (*Bacteria, *Metabolism), Nitrates.

For abstract, see NSA 32 03, number 06474.

13C. Construction Equipment Materials, and Supplies

N75-26141/2GA PC$3.75/MF$2.25
Stuttgart Univ. (West Germany). Inst. fuer Statik und Dynamik der Luft- und Raumfahrtkonstruktionen.
Thermomechanical Creep of Aging Concrete: A Unified Approach.
J. H. Argyris, K. S. Pister, and K. J. Willam. 1974, 47p ISD-167
Contract SBB-4
Subm-Sponsored in Part by Fulbright Grant.

Descriptors: *Aging (Materials), *Concretes, *Creep properties, *Temperature effects, Axial stress, Convolution integrals, Differential equations, Loading rate, Mathematical models, Viscoelasticity.

For abstract, STAR 1317

PAT-APPL-495 486/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Process for Manufacturing Wallboard and the Like.
Patent Application,
Murray Arthur Schwartz, and Thomas Oscar Llewellyn. Filed 8 Aug 74, 12p DOCKET/MIN-2152
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Wallboard, *Patent applications, Sulfur, Gypsum, Foam.

The patent application discloses a process for manufacturing wallboard and the like comprising a basic composition of sulfur and gypsum wherein sulfur is foamed by the vaporization of the water contained in the gypsum, thereby producing a stable foam that may be compressed under pressure between sheets of wallboard covering material.

PAT-APPL-504 925/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Polymer Concrete.
Patent Application,
W. Glenn Smoak, and Fred E. Causey. Filed 11 Sep 74, 9p DOCKET/REC-2112
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Polymers, *Aggregates, *Patent applications, Concretes, Polymethyl methacrylate, Polymerization, Catalysts, Silanes.
Identifiers: *Polymer concretes, PAT-CL-260-42.

The patent application concerns a polymer concrete which may be mixed and formed using equipment and techniques identical to those used with Portland cement concrete comprises a conventional concrete aggregate and a polymer binder. The polymer binder consists of methyl methacrylate reacted with a cross-linking agent in the presence of a suitable peroxide catalyst. A catalyst promoter, such as dimethyl aniline, allows ambient temperature polymerization in a relatively short time; on the order of 3 to 5 hours. Addition of particular silane-type materials increases the strength of the polymer-aggregate bond and increases the strength at the cured concrete product.

PATENT-3 865 075
Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Slab Impregnation Apparatus.
Patent,
James K. Klein, Anthony J. Romano, Lawrence E. Kukacka, and Joseph J. Fedelem. Filed 4 Oct 73, patented 11 Feb 75, 4p PAT-APPL-403 586
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Bridge decks, *Maintenance equipment, *Patent applications, Patents, Concrete slabs, Impregnating, Polymers, Polymerization.
Identifiers: PAT-CL-118-50.

The patent application relates to an apparatus for the repair of a concrete section. It contains an impregnation device to impose a slight vacuum over the affected area and probes to inject a monomer mixture which polymerizes in situ to produce a repaired section which can be returned to normal service.

PB-243 106/2GA PC$4.75/MF$2.25
Ohio Dept. of Transportation, Columbus. Bureau of Testing.
Development of Laboratory Methods for Determining D-Cracking Susceptibility of Ohio Gravel and Limestone Coarse Aggregates in Concrete Pavements.
Final rept.,
F. M. Williams, A. Trefny, J. T. Paxton, and H. D. Davis. 15 Feb 74, 77p OHIO-DOT-07-74

Descriptors: *Concrete pavements, *Aggregates, *Cracking(Fracturing), Gravel, Limestone, Laboratory tests, Concrete durability, Absorption, Adsorption, Particle size, Ohio.
Identifiers: DOT/4BZ/BA.

The D-cracking susceptibility of Ohio gravel and limestone coarse aggregates can be determined in the laboratory by a rapid freeze and thaw test performed in a manner similar to ASTM C 666 Procedure A or B. Procedure A is much more severe than Procedure B and test results can therefore be obtained more rapidly. Test data from both methods correlate well with the service records of coarse aggregates used in concrete pavements. The absorption-adsorption test does not appear to be a desirable method of determining D-cracking susceptibility of Ohio limestone and gravel coarse aggregates. Test data obtained by this method does not correlate well with aggregate service records.

PB-243 485/0GA PC$3.60/MF$2.25
Transportation Research Board, Washington, D.C.
PCC Pavements for Low-Volume Roads and City Streets.
Final rept.
May 75, 45p TRB/NCHRP/SYN-27, ISBN-0-309-02309-2
Report on National Cooperative Highway Research Program, Synthesis of Highway Practice. (Library of Congress Catalog Card no. 75-13909).

Descriptors: *Concrete pavements, *Portland cements, Management planning, Design, Traffic, Roads, Highways, Construction, Reviews.
Identifiers: DOT/4BZ/BC, DOT/4CZ/CA.

This report presents the results of a comprehensive review and assessment of current practice in the use of portland cement concrete pavement for roads and streets where low volumes of traffic are anticipated. Information is presented on the factors to be considered in planning the low volume pavement project, and on designing and constructing portland cement concrete pavements for low volume use. Research needs are identified.

PB-243 740/8GA PC$3.25/MF$2.25
Transport and Road Research Lab., Crowthorne (England).
The Use of Waste and Low-Grade Materials in Road Construction: 2. Colliery Shale,
P. T. Sherwood. 1975, 25p TRRL-LR-649

Descriptors: *Solid waste disposal, *Construction materials, *Tailings, *Reclamation, *Roads, Coal mines, Shales, Soil stabilization, Concrete pavements, Pavement bases, Materials handling, Soil cement, Utilization, Aggregates, Tests, Great Britain.
Identifiers: *Mine wastes.

The use of lower-grade and waste materials as alternatives to naturally occurring aggregates in the construction of roads helps to conserve the supplies of good quality aggregates and assists in problems arising from the disposal of unwanted materials. This Report is one of a series that is aimed at bringing together the information that is available on each of the major waste products that have roadmaking potential. It deals with colliery shale and it considers the extent to which shale can be used in road construction. The Report discusses the types and quantity of shale that are available, the purposes to which it can be put in the various stages of road construction and the tests needed to ensure that shales meet the required specifications.

PEL-238 PC$4.75/MF$2.25
Atomic Energy Board, Pelindaba, Pretoria (South Africa).
Wood-Polymer Composite Mosaic Flooring in South Africa. A Technical and Economic Evaluation.
T. A. du Plessis, and R. C. B. Stevens. Jun 74, 34p
U.S. Sales Only.

Descriptors: (*Wood-plastic composites, *Economics), Building materials, Physical properties, Wear resistance.

For abstract, see NSA 32 03, number 07208.

13D. Containers and Packaging

PATENT-3 164 148 Not available NTIS
Department of the Army Washington D C
Insulated Container.
Patent,
Joseph Tolciss. Filed 15 Jan 64, patented 5 Jan 65, 2p Rept nos. PAT-APPL-337 963,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Containers, *Food dispensing, *Thermal insulation, Cold weather, Arctic regions, Military applications, Crystals, Crystallization.
Identifiers: PAT-CL-126-375.

The patent concerns a novel insulated container to keep food or drink hot in cold climates. The efficiency of the insulated container is enhanced by the use of crystals of various kinds which are first liquefied by heat and thereafter permitted to crystallize in which process they give off heat. permitted to crystallize in which process they give off heat. The fusible heat storing and diffusing material is disposed around the top of the container wall to offset any loss of heat through an upper double wall area which may be depleted of insulation by the packing.

13E. Couplings, Fittings, Fasteners, and Joints

AD-A013 879/2GA PC$3.75/MF$2.25
Air Force Materials Lab Wright-Patterson AFB Ohio
Stresses in An Adhesive Bonded Composite-to-Metal Assembly.
Technical rept.,
Theodore J. Reinhard, Jr., and Weldon M. Scardino. Jun 75, 34p Rept no. AFML-TR-75-14
See also AD-882 745.

Descriptors: *Bonded joints, Adhesive bonding, Stresses, Composite materials, Stainless steel, Boron, Epoxy resins, Airframes.
Identifiers: Boron reinforced plastics, Epoxy matrix composites, Steel 321.

An in-house program was initiated in order to demonstrate the engineering feasibility of the use of boron/epoxy composites to add stiffness to metallic structural components. The program was designed to determine the level of the stresses induced in the boron epoxy (B/E) composite, the 321 stainless steel substrate and in the structural adhesive joining the two adherends.

AD-A013 923/8GA PC$7.50/MF$2.25
Grumman Aerospace Corp Bethpage N Y
Exploratory Development of Weld Quality Definition and Correlation with Fatigue Properties.
Final rept. 29 Sep 72-31 Oct 74,
Robert Witt, and Olev Paul. Apr 75, 240p AFML-TR-75-7
Contract F33615-72-C-2039

Descriptors: *Weldments, *Welded joints, *Titanium alloys, Fatigue(Mechanics), Defects(Materials), Electron beam welding, Plasma arc welding, Gas metal arc welding, Gas tungsten arc welding, Nondestructive testing, Acceptance tests, Airframes.
Identifiers: Titanium alloy 6Al 4V.

The purpose of this program was to conduct an exploratory evaluation of the effects of typical weld anomalies on fatigue endurance of Ti-6Al-4V titanium alloy weldments and to propose criteria for acceptance/rejection of titanium fusion welds.

GEPP-144 PC$4.00/MF$2.25
General Electric Co., St. Petersburg, Fla. Neutron Devices Dept.
Ultrasonic Testing of Electron Beam Closure Weld on Pressure Vessel.
R. W. Andrews. 16 May 75, 12p
Contract AT(29-2)-656

Descriptors: (*Pressure vessels, Closures), (*Closures, *Electron beam welding), Welded joints.

For abstract, see NSA 32 03, number 06356.

ORNL-TM-4800 PC$4.50/MF$2.25
Oak Ridge National Lab., Tenn.
Measurement of Flaw Size in a Weld Sample by Ultrasonic Frequency Analysis.
H. L. Whaley, Jr, L. Adler, K. V. Cook, and R. W. McClung. May 75, 26p
Contract W-7405-eng-26

Descriptors: (*Welded joints, *Ultrasonic testing), (*Steels, *Defects), Inspection, Transducers.

For abstract, see NSA 32 03, number 07055.

PATENT-3 157 931 Not available NTIS
Department of the Army Washington D C
Backing Plate Hanger.
Patent,
Cornelius J. McKeown. Filed 29 Jul 63, patented 24 Nov 64, 3p Rept nos. PAT-APPL-298 509,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Hangers, *Clamps, *Patents, Plates, Fastenings, Release mechanisms.
Identifiers: PAT-CL-24-263.

The invention relates to backing plate hangers for anchoring clamps. A hanger is supported by one of the clamping screws and secured thereto against loss by readily removable fastener means.

PATENT-3 170 473 Not available NTIS
Department of the Army Washington D C
Captive Bolt.
Patent,
Ernest W. Downs, and Philias F. La Casse. Filed 12 Sep 62, patented 23 Feb 65, 3p Rept nos. PAT-APPL-228 211,
Previously filed as PAT-APPL-794 478, 19 Feb 59.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Bolts, *Patents, Bolted joints, Fastenings, Structural members.
Identifiers: PAT-CL-135-3, Captive bolts.

The invention relates to a captive bolt. It has to do particularly with a primary stress carrying unit, such as a captive bolt, or captive bolt assembly, for use in assembling or putting together structural members.

SAA-DR-75037 PC$4.25/MF$2.25
Standards Association of Australia, North Sydney.
Australian Standard Methods for the Radiographic Examination of Fusion Welded Butt Joints in Steel (Metrication and Revision of as B164-1965).
15 Mar 75, 21p
U.S. Sales Only.

Descriptors: (*Steels, Butt welds), (*Butt welds, *Gamma radiography), Standards, X-ray radiography.

For abstract, see NSA 32 03, number 06357.

TID/SNA-2114 PC$4.00/MF$2.25
Anamet Labs., Inc., Berkeley, Calif.
Fatigue Tests of Welded 6061-T6 Aluminum at Liquid Hydrogen Temperature.
S. Yamahara, E. Flora, and R. Hunnicutt. 8 Feb 71, 19p

Descriptors: (*Aluminium base alloys, *Fatigue), Failures, Stresses, Ultralow temperature, Welded joints.

For abstract, see NSA 32 03, number 07063.

Y-1967 PC$5.45/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Thermophysical Properties of a Type 308 Stainless Steel Weld.
J. D. Lore, H. L. Richards, R. T. King, L. M. Greene, and D. M. Darby. 30 Apr 75, 51p
Contract W-7405-eng-26

Descriptors: (*Stainless steel-304, Welded joints), (*Stainless steel-308, Welded joints), (*Welded joints, *Thermodynamic properties), Lmfbr type reactors, Specific heat, Thermal conductivity, Thermal diffusivity, Thermal expansion.

For abstract, see NSA 32 03, number 07067.

13F. Ground Transportation Equipment

AD-A013 769/5GA PC$20.00/MF$20.00
Army Materiel Command Alexandria Va
Engineering Design Handbook. Military Vehicle Power Plant Cooling.
Jun 75, 641p Rept no. AMCP-706-361

Descriptors: *Military vehicles, *Engine components, *Cooling, *Handbooks, Liquid cooling, Heat transfer, Cooling fans, Temperature control, Grilles, Fluid flow, Installation.
Identifiers: *Engineering design handbooks, Air cooled.

The Engineering Design Handbook Series of the US Army Materiel Command is a coordinated series of handbooks containing basic information and fundamental data useful in the design and development of Army materiel and systems. The handbooks are authoritative reference books of practical information and quantitative facts presented to be helpful in the design and development of materiel that will meet the technical needs of the Armed Forces. The Military Vehicle Power Plant Cooling Handbook is intended to serve as a basic reference for the vehicle cooling system designer. The material presented was compiled from reports, publications, interviews, and data provided by various agencies. This handbook will be of particular value to the users and program managers in their role in the development of new vehicles. It will serve as a guide to (a) the generation of realistic vehicle specifications, (b) total system integration in cooling system design, and (c) a complete cooling system development and corrective action program in the vehicle development cycle.

AD-A013 828/9GA PC$3.25/MF$2.25
Cold Regions Research and Engineering Lab Hanover N H
Traction Aid for Wheeled Vehicles.
Special rept.,
Ben Hanamoto. Jul 75, 13p Rept no. CRREL-SR-232

Descriptors: *Ground vehicles, Traction, Snow, Depth, Mobility, Trucks, Vehicle wheels, Vehicle tracks, Tire chains, Tires, Performance(Engineering), Acceptability, Storage, Installation, Human factors engineering.
Identifiers: M-35 trucks(2-1/2-ton), 2-1/2 ton trucks.

Performance tests with the Tyr-Trac traction aid device for wheeled vehicles had been conducted in Alaskan snow, and the results were so encouraging that further testing of the device was requested. In comparison to tire chains, the Tyr-Trac out-performed chains in all areas of operation. Additional tests were conducted in northern Michigan, comparing the drawbar pull-slip performance of an M35-A2 2-1/2-ton, 6 x 6 truck equipped with the Tyr-Trac, tire chains and with standard military tires at an inflation pressure of 15 psi. The results of these tests in no way duplicate the Alaskan results. Traction aids were of no use in snow deeper than 20 inches. Tests could be conducted only by reducing the snow cover to a depth of 12 to 17 inches. Under these conditions both Tyr-Trac and chains performed equally, with a drawbar-pull to weight ratio, DBP/W, equal to about 0.10. If traction aids were to be used in shallower snow, tire chains would be preferred over the Tyr-Trac for these reasons: less weight and bulk for more convenient on-board stowage, more economical, and easier installation and removal in the field.

AD-A013 982/4GA PC$4.75/MF$2.25
Military Traffic Management Command Washington D C
Joint Services Highway Shock Index Project.
Engineering rept.,
John H. Grier, Norman J. MacLeod, Francis R. Fisher, and Larry S. Marr. Jun 75, 86p Rept no. MTMC-75-17

Descriptors: *Highways, *Land transportation, *Cargo, *Shock mitigation, Shipping, Loads(Forces), Vehicles, Classification.
Identifiers: SI(Shock Index), *Shock index.

The United States Army, Navy, Air Force, and Marine Corps have jointly sponsored and participated in the development of a Shock Index (SI) for highway transportation. A numerical SI associated with a particular vehicle-load combination can now be determined at a low cost by application of simple static field measurements. The SI provides classification for vehicle-load combinations as regards probability of shocks transmitted to the cargo during highway shipments. This work represents the first known attempt to develop a procedure for classifying highway cargo vehicles on the basis of their rough riding characteristics. The procedure cannot be used for predicting the expected highway shock environment but can be used for classification as regards relative magnitude of shock.

PATENT-3 161 248 Not available NTIS
Department of the Army Washington D C
Vehicle Wheel Suspension.
Patent,
Theodoric B. Edwards. Filed 8 Jun 62, patented 15 Dec 64, 6p Rept nos. PAT-APPL-201 216,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Vehicle wheels, *Suspension devices, *Patents, Torsion bars, Linkages, Electric motors, Drives.
Identifiers: PAT-CL-180-10.

The invention relates to improvements in land vehicle propulsion, in amphibious vehicle propulsion, and in support wheels. More particularly, this invention relates to vehicle wheels which have torsion support means supporting the wheel rim from within, and a coupling to transmit torque from the hub to the rim. These systems are adapted to use with individual driving electric motors.

PB-243 521/2GA PC$7.25/MF$2.25
Michigan Univ., Ann Arbor. Highway Safety Research Inst.
Analytic Tire Model. Phase I: The Statically Loaded Toroidal Membrane.
Final rept. 30 Jul 74-30 Jun 75,
J. T. Tielking. Jul 75, 217p UM-HSRI-PF-75-7
Also pub. as Tire Traction Characteristics Affecting Vehicle Performance, Interim Document 10. Prepared in cooperation with Motor Vehicle Manufacturers Association of the United States, Inc., Detroit, Mich.

Descriptors: *Automobile tires, *Structural analysis, *Traction, Mathematical models, Deformation, Stresses, Strains, Equations, Shear stress, Loads(Forces), FORTRAN, Structural design, Computer programs.
Identifiers: Bead rings, Pneumatic tires, PATCH computer program, PDP 11/45 computers, Tire beads.

The document presents the final report on the development of a preliminary analytic tire model. The preliminary model is an isotropic toroidal membrane with inner edges bonded to rigid bead rings. The toroid is inflated and deflected against a frictionless flat surface. Solutions are obtained for (a) The deformed shape and contact boundary; (b) strain and stress distributions, including principal stresses; (c) normal (hoop and radial) and shear stress distributions on the bead ring; and (d) tire load as a function of inflation pressure and loaded radius. Digital computer programs are included.

PB-243 840/6GA PC$6.25/MF$2.25
Management Science Associates, Los Altos, Calif.
Indianapolis Terminal Planning Study.
Final rept.
Jun 75, 158p USRA/R-047
Contract USRA-50102

Descriptors: *Railroad terminals, *Management planning, Operations research, Manpower utilization, Cost effectiveness, Terminal facilities, Management control, Indiana.
Identifiers: *Indianapolis(Indiana).

The objective of the study was to determine the terminal's true potential for improvement. Some areas considered were labor utilization and effectiveness, operations performance, budget control, and profit improvement. A definite need for modern management methods, and information system to aid in decision-making, and the training of supervisors to use these tools was found. A new terminal management system was outlined. Recommendations were made for specific operations based on management improvement. Continuous time studies and work samplings were used to evaluate labor utilization. Analysis of terminal operational data was used to evaluate terminal effectiveness. Management Center Reports were used for analysis of operating expenses.

PB-244 048/5GA PC$8.75/MF$2.25
Boeing Vertol Co., Philadelphia, Pa. Surface Transportation Systems Dept.
State-of-the-Art Car Development Program Final Test Report. Volume I. Component Testing.
Aug 74, 291p D174-10024-1 UMTA-IT-06-0026-74-1
Contract DOT-UT-10007
See also Volume 2, PB-244 048.
Paper copy also available in set of 5 report as PB-244 047-SET, PC$26.00.

Descriptors: *Rapid transit railways, *Urban transportation, *Railroad cars, Design, Tests, Documents, Propulsion, Brakes(Motion arresters), Engines, Motors, Seats, Materials, Fire safety, Windshields, Transportation planning, Passenger transportation.
Identifiers: *SOAC(State of the art Cars), *State of the art cars, DOT/4DZ/DC, Compliance testing, Comuter rail systems.

The Urban Rapid Rail Vehicle and Systems Program is an integrated development program directed toward improving high speed, frequent-stop urban rail systems. The overall objective is to enhance the attractiveness of rail transportation to the urban traveler by providing service that is as comfortable, reliable, safe and economical as possible. The objective of the State-of-the-Art Car (SOAC) is to demonstrate the best state-of-the-art in rapid rail car design, with two improved cars using existing proven technology. Primary goals for the cars are passenger convenience and operating efficiency. This document, Volume 1 of the SOAC Final Test Report, presents the test results of the component testing of the State-of-the-Art car. The purpose of these tests was to show compliance with the SOAC Detail Specification (NTIS PB-225 934). All component tests were conducted by the supplier of the applicable subsystems. An introduction, test procedures and results, and conclusions are presented. Appendices are titled: Propulsion, Dynamic Braking and Auxiliary Power Equipment; Truck Frame; Truck Bolster; Windshield; Seat Strength; and Materials - Fire Resistance.

PB-244 049/3GA PC$5.75/MF$2.25
Boeing Vertol Co., Philadelphia, Pa. Surface Transportation System Dept.
State-of-the-Art Car Development Program Final Test Report. Volume 2. Subsystem Functional Testing.
Final rept. Jul 72-Mar 73,
W. Dunton. Nov 74, 143p D174-10024-2 UMTA-IT-06-0025-74-3
Contract DOT-UT-10007
See also Volume 1, PB-244 048, and Volume 3, PB-244 050.
Paper copy also available in set of 5 reports as PB-244 047-SET, PC$26.00.

Descriptors: *Rapid transit railways, *Urban transportation, *Railroad cars, Tests, Documents, Transportation lighting, Environmental engineering, Engines, Motors, Automatic control equipment, Brakes(Motion arresters), Passenger transportation.
Identifiers: Compliance testing, *SOAC(State of the Art Cars), *State of the art cars, DOT/4DZ/DC, Commuter rail systems.

The Urban Rapid Rail Vehicle and Systems Program is an integrated development program directed toward improving high speed, frequent-stop urban rail systems. The objective of the State-of-the-Art Car (SOAC) is to demonstrate the best state-of-the-art in rapid rail car design, with two improved cars using existing technology. Primary goals for the cars are passenger convenience and operating efficiency. This document, Volume 2 of the SOAC Final Test Report, presents the test results for the subsystem functional testing of state-of-the-art transit cars. The purpose of these tests was to show compliance with the SOAC Detail Specification (NTIS no. PB-222 147). After adjustments and changes where required, all subsystems met the requirements of the detail specification.

Chapters of the report present instrumentation, test procedures and results, and conclusions. Items discussed in the chapter on test procedures and results are car body, lighting, wiring, equipment, main propulsion control and motor rotation, braking, propulsion auxiliaries, car weight, pantograph, air compressor, hostling panel, and visual.

PB-244 050/1GA PC$8.75/MF$2.25
Boeing Vertol Co., Philadelphia, Pa. Surface Transportation Systems Dept.
State-of-the-Art Car Development Program Final Test Report. Volume 3. Acceptance Testing.
Final rept. Jul 72-Mar 73,
P. Brown. Apr 74, 284p D174-10024-3 UMTA-IT-06-0026-74-4
Contract DOT-UT-10007
See also Volume 2, PB-244 049, and Volume 3, PB-244 051.
Paper copy also available in set of 5 reports as PB-244 047-SET, PC$26.00.

Descriptors: *Rapid transit railways, *Urban transportation, *Railroad cars, Tests, Documents, Performance, Quality assurance, Noise pollution, Electromagnetic interference, Passenger transportation, Transportation planning.
Identifiers: *SOAC(State of the Art Cars), *State of the art cars, Compliance testing, Commuter rail systems, DOT/4DZ/DC.

The Urban Rapid Rail Vehicle and Systems Program is an integrated development program directed toward improving high speed, frequent-stop urban rail systems. The objective of the State-of-the-Art Car (SOAC) is to demonstrate the best state-of-the-art in rapid rail car design, with two improved cars using existing proven technology. Primary goals for the cars are passenger convenience and operating efficiency. This document, Volume 3 of the SOAC Final Test Report, presents the test results for the vehicle acceptance testing of two state-of-the-art transit cars. Performance, ride quality, noise and electromagnetic interference (EMI) acceptance tests were conducted. Chapters contain a summary of test results, configuration, test equipment and instrumentation, and test procedures.

PB-244 051/9GA PC$3.75/MF$2.25
Boeing Vertol Co., Philadelphia, Pa. Surface Transportation Systems Dept.
State-of-the-Art Car Development Program Final Test Report. Volume 4. Simulated Demonstration Test.
Final rept. Jul-Aug 73,
T. Gordon. Oct 74, 50p D174-10024-4 UMTA-IT-06-0026-74-5
Contract DOT-UT-10007
See also Volume 3, PB-244 050, and Volume 4, PB-244 052.
Paper copy also available in set of 5 reports as PB-244 047-SET, PC$26.00.

Descriptors: *Rapid transit railways, *Urban transportation, *Railroad cars, Tests, Urban areas, Transportation routes, Maintenance, Quality assurance, Passenger transportation, Transportation planning.
Identifiers: *SOAC(State of the Art Car), *State of the art cars, DOT/4DZ/DC, Compliance testing, Commuter rail systems.

The Urban Rapid Rail Vehicle and Systems Program is an integrated development program directed toward improving high speed, frequent-stop urban rail systems. The objective of the State-of-the-Art Car (SOAC) is to demonstrate the best state-of-the-art in rapid rail car design, with two improved cars using existing proven technology. Primary goals for the cars are passenger convenience and operating efficiency. Simulated Demonstration Tests of the SOAC two-car train was conducted with the purpose to enhance the probability of trouble-free operation in the demonstrations for the riding public to be held in the cities of New York, Boston, Chicago, Cleveland, and Philadelphia. The demonstration profile was set up as a composite of the five demonstration city routes.

PB-244 052/7GA PC$4.25/MF$2.25
Boeing Vertol Co., Philadelphia, Pa. Surface Transportation Systems Dept.
State-of-the-Art Car Development Program Final Test Report. Volume 5. Post Repair Testing.
Final rept. Jan-Apr 74,
G. Christiansen. Dec 74, 65p D174-10024-5 UMTA-IT-06-0026-74-6
Contract DOT-UT-10007
See also Volume 4, PB-244 051.
Paper copy also available in set of 5 reports as PB-244 047-SET, PC$26.00.

Descriptors: *Rapid transit railways, *Urban transportation, *Railroad cars, Tests, Accidents, Maintenance, Quality assurance, Passenger transportation, Transportation planning.
Identifiers: *SOAC(State of the Art Car), *State of the art cars, DOT/4DZ/DC, Compliance testing, Commuter rail systems.

The Urban Rapid Rail Vehicle and Systems Program is an integrated development program directed toward improving high speed, frequent-stop urban rail systems. The objective of the State-of-the-Art car (SOAC) is to demonstrate the best state-of-the-art in rapid rail car design, with two improved cars using existing proven technology. Primary goals for the cars are passenger convenience and operating efficiency. This document presents the test results for the Post-Repair Testing of the SOAC. The purpose of these tests was to show: (1) compliance with the SOAC Detail Specification (NTIS no. PB-222 147) following repairs to the Number 2 car damaged in an accident on August 11, 1973 at the DOT High Speed Ground Test Center, Pueblo, Colorado; and (2) to complete the Simulated Demonstration Testing (Volume 4) which had been interrupted by the accident. Chapters present configuration, instrumentation, test procedures, test results and conclusions.

PB-244 067/5GA PC$4.75/MF$2.25
Gibbs and Hill, Inc., New York.
Penn Central Electrification New York Tunnels 25 kV vs. 12.5/25 kV.
Final rept.
Apr 75, 85p FRA/ONECD-75-51
Contract DOT-FRA-30065

Descriptors: *Electric railroads, *Railroad tunnels, Power lines, Revisions, Conversion, Cost estimates, New York, Main line railroads, Clearance.
Identifiers: DOT/2C, DOT/4CZ/CC, New York City(New York).

The proposed conversion of the a-c electrified portion of the Penn Central Railroad to 25 kV, 60 Hz involves modifications to provide sufficient electrical clearance, particularly in the tunnels at New York, Philadelphia, Baltimore and Washington. The object of this study was to investigate the extent and cost magnitude of modifications to tunnels in the New York area, and compare them to alternative of providing dual-voltage equipment for all trains operating in this area.

PB-244 227/5GA PC$5.75/MF$2.25
International Harvester Co., Fort Wayne, Ind. Truck Div. Engineering.
Truck Noise IV-D: The Reduction of Engine Noise on Heavy Duty Diesel Trucks.
Rept. no. 5,
J. T. Shrader. Apr 75, 127p DOT/TST-75-88
Contract DOT-OS-20222
See also report no. 4, PB-238 361.

Descriptors: *Engine noise, *Noise reduction, *Motor trucks, Truck engines, Diesel engines, Vibration, Shielding, Coverings, Enclosures, Weight(Mass), Tests, Performance evaluation, Combustion, Mechanical properties.
Identifiers: DOT/4DZ/DG, DOT/5B.

The vibration of the external surfaces of the engine is sometimes a major cause of noise emissions from a Detroit Diesel 8V-71, two cycle diesel engine. Since major engine modifications were beyond the scope of this project, the reduction in engine noise was obtained through shielding. One shielding technique employed close-fitting acoustical covers mounted to the engine itself. Another employed a partial engine enclosure mounted to the chassis. With both shielding techniques, the proper acoustical lining was found to be important as well as sealing. A Detailed development of these shields is given.

PB-244 292/9GA
Mag Tape $97.50;Foreign $122.50
Federal Railroad Administration, Washington, D.C. Office of Research and Development.
Truck Design Optimization Project Field Test Data - Series 1, Tape TDOP 0010.
Data file,
A. J. Bang. Feb 75, 1 reel mag tape FRA/ORD/MT-75/64 FRA/DF-75/001
Available only in 9 track, 800 or 1600 bpi, odd parity, ASCII and Binary. Documentation available.

Descriptors: *Data file, *Freight cars, *Dynamic tests, Magnetic tapes, Undercarriage, Loads(Forces), Performance evaluation, Suspension systems(Vehicles), Velocity, Railroad tracks, Data acquisition, Displacement, Measurement.
Identifiers: DOT/4DZ/DC.

Up to 48 channels of data are collected and digitized on board Instrument Car SP250. Data include acceleration, forces, and displacements, measured at critical points on a freight car and truck tested with various modifications on various tracks at various speeds from 10 mph (16 km/hr) to 79 mph (127 km/hr). Each test run is from 5 to 15 minutes in length, with 200 samples per second per channel (9600 total samples per second) so that from 1 to 4 such tests may be stored as separate files on each reel.

13G. Hydraulic and Pneumatic Equipment

AD-A014 001/2GA PC$3.75/MF$2.25
Honeywell Inc St Louis Park Minn Government and Aeronautical Products Div
Hydraulic Control Handle/Elevation Axis Closed-Loop System Evaluation (Fluidic Armament Control System).
Final rept. May 74-Jan 75,
R. V. Burton. May 75, 47p Rept no. 45891 RIA-R-CR-75-026
Contract DAAA09-74-C-2047

Descriptors: *Combat vehicles, *Gun turrets, *Fluidic control, Tanks(Combat vehicles), Fire control systems, Hydraulic servomechanisms, Stabilized platforms, Closed loop systems.
Identifiers: *Stabilized guns, MICV-65 vehicles.

The investigation of Fluidic Armament Control System (FACS) mechanizations for combat vehicle stabilized-gun/turret-control system applications was initiated in 1968 based on the need for developing low-cost systems. The accomplishments in this program result from effort, conducted on three limited-scope contracts over the 1968-1974 time frame, to demonstrate for the first time the closed-loop operation of an all-fluidic stabilized gun tracking system. A laboratory demonstration was conducted of an elevation axis system.

PATENT-3 734 116 Not available NTIS
Department of the Army Washington D C
Back Pressure Sensitive Switch for a Flueric Device.
Patent,
R. Pierce Trask, II. Filed 1 Sep 71, patented 22 May 73, 6p Rept nos. PAT-APPL-177 033,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pressure switches, *Fluidic control, *Patents, Fluid amplifiers, Back pressure, Ports(Openings), Vents.
Identifiers: PAT-CL-137-836.

The patent relates to a back pressure sensitive fluidic switching mechanism. A fluidic device incorporating this mechanism will switch from one output receiver channel to another under the effect of back pressure produced by a control signal issuing from a control port disposed at, in or near the output channel of the device. Decoupling vents are provided downstream of the control ports in each output receiver channel so as to insulate the device from the effects of load impedance.

13H. Industrial Processes

AD-A013 584/8GA PC$5.25/MF$2.25
Sperry UNIVAC St Paul Minn Defense Systems Div
Titanium-Aluminum Ultra-Thin Film Deposition Study.
Final technical rept. Oct 74-Jun 75,
R. H. Dean, S. J. Lins, M. C. Paul, and E. J. Torok. 24 Jun 75, 113p Rept no. PX-11332
Contract DAAK02-75-C-0036

Descriptors: *Vapor plating, *Thin films, Metal films, Aluminum, Titanium, Substrates.
Identifiers: *Vacuum deposition.

A process was developed for the vacuum deposition of multilayer titanium-aluminum films at a rate of one pound per hour. Source tooling was developed. Multi-titanium-aluminum films were vacuum deposited and removed from the substrate. Means of smoothing the substrate and releasing the multilayer thin films from the substrate were investigated.

AD-A013 601/0GA PC$3.75/MF$2.25
Battelle Columbus Labs Ohio
Hydrogen in HY-130 Metal.
Rept. no. 1 (Annual) Jun 74-Jul 75,
D. G. Howden, and P. A. Tews. 31 Jul 75, 40p
Contract N00014-74-C-0407

Descriptors: *Steel, *Hydrogen, Misch metal, Hydrides, Weld metal, Fillers, Wire, Inert gas welding, Argon, Arc welding, Getters, Cerium, Lanthanum, Physical properties, Hydrogen embrittlement, Contamination, Diffusion, Welds.
Identifiers: Steel HY-130, HY-130 steel, Steel HY-140, HY-140 steel.

This report summarizes the first years investigation directed at improving the mechanical properties of HY-140 weld metal by controlling hydrogen contamination. The addition of 0.2 percent hydride formers (Misch Metal) to weld metal has been shown to eliminate diffusible hydrogen at room temperature when the argon arc shielding gas was contaminated to a 5 percent level. The hydrides formed were stable on heating to a temperature of 760 C. Misch Metal at the 0.1 percent level in the filler wire was transferred to the weld metal with an efficiency of about 20 percent and no change in metal transfer characteristics was noted. Wire with greater than 0.1 percent Misch Metal proved difficult to fabricate with the techniques investigated. (Author)

AD-A013 860/2GA PC$3.25/MF$2.25
Rock Island Arsenal Ill General Thomas J Rodman Lab
A Vacuum-Forming Process for Manufacturing Weapon Accessories from Coated Fabrics.
Technical rept. Dec 71-Aug 74,
Thomas J. Koehler. Dec 74, 21p Rept no. RIA-R-TR-75-004

Descriptors: *Material forming, Fabrication, Fabrics, Plastic coatings, Acrylic resins, Nylon, Polyester fibers, Vinyl plastics, Urethanes, Coverings, Bags, Containers.
Identifiers: *Vacuum forming, Coated fabrics.

Selected vacuum-forming techniques were used to fabricate test parts from coated fabrics. A technique in which a secondary ring-die approach is used was successful in eliminating fabrication problems such as webbing, nonuniform wall thickness and material thinout or deterioration. Elastic knit or heat-stretchable woven substrates coated with polyether urethane or ethylene vinyl acetate were acceptable materials for the fabricating of test parts. The coated nonwoven substrates evaluated could not be vacuum-formed because of low-stretch characteristics. Materials successfully vacuum-formed did not meet strength requirements of MIL-C-20696, 'Cloth, Coated, Nylon, Waterproof'. Heavier materials that met strength requirements were only partially vacuum-formable with the use of laboratory equipment. These materials could potentially be completely molded by production scale vacuum formers.

N75-26030/7GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Process for the Manufacture of Parts with a Silicon Oxynitride Base.
J. P. Mary, P. Lortholary, P. Goursat, and M. Billy. Jul 75, 15p NASA-TT-F-16440
Contract NASW-2481
Tran-Transl. Into English from French Patent Application No. 2.221.421 (15 Mar. 1973) 13 p.

Descriptors: *Refractory metals, *Silicon nitrides, Heat treatment, Manufacturing, Powder metallurgy.

For abstract, STAR 1317

PATENT-3 156 039 Not available NTIS
Department of the Army Washington D C
High Energy Forming Process.
Patent,
Charles H. Martens. Filed 24 Sep 63, patented 10 Nov 64, 2p Rept nos. PAT-APPL-311 259,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *High energy rate forming, *Patents, Cryogenics, Stainless steel.
Identifiers: Steel 301, PAT-CL-29-421.

The patent relates to improving high energy metal forming processes by using low-temperature fluids as a medium for transmitting pressure in lieu of water and other commonly used fluids such as air.

PATENT-3 156 041 Not available NTIS
Department of the Army Washington D C
Method of Soldering and Brazing Structural Elements.
Patent,
Frank M. Gault. Filed 18 Apr 60, patented 10 Nov 64, 3p Rept nos. PAT-APPL-22 903,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Soldering, *Brazing, *Patents, Sandwich panels, Airplane panels.
Identifiers: PAT-CL-29-471-1.

The patent relates to the manufacture of lightweight hollow structural elements and it relates particularly to methods of brazing or soldering lightweight hollow structural elements such as, for example, sandwich-type or skin panels for aircraft and the like and to the resulting products.

PATENT-3 180 021 Not available NTIS
Department of the Army Washington D C
Weld Joint Backing and Method of Welding with Same.
Patent,
James N. Corden, Robert M. Evans, and Perry J. Rieppel. Filed 21 Nov 62, patented 27 Apr 65, 4p Rept nos. PAT-APPL-239 386,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Welding, *Patents, Particles, Backup systems, Steel, Welded joints.
Identifiers: PAT-CL-29-483.

The patent relates generally to improvements in the art of welding and particularly relates to loose particle backing materials used to support molten weld metal in the joints of material being welded.

PATENT-3 734 723 Not available NTIS
Department of the Army Washington D C
Compacted and Sintered Powder Mass Having a Discrete Cavity in the Mass and Method of Forming.
Patent,
Earl B. Blasch, Richard M. Klingaman, and Daniel M. Page. Filed 4 Sep 70, patented 22 May 73, 2p Rept nos. PAT-APPL-69 977,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Powder metallurgy, *Patents, Compacting, Sintering, Cavities, Structures, Fabrication.
Identifiers: PAT-CL-75-214.

The patent relates to a structure and method of forming the structure of a compacted and sintered powder mass having one or more discrete cavities in the mass. Each cavity within the mass is formed by the vaporization through sintering of a core material compacted within the powder mass prior to sintering.

PATENT-3 865 298 Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Solder Leveling.
Patent,
Travis A. Allen, and Robert T. Sylvester. Filed 14 Aug 73, patented 11 Feb 75, 6p PAT-APPL-388 305
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Soldering, *Patents, Solders, Removal, Printed circuits, Jets.
Identifiers: PAT-CL-228-20.

The patent relates to removal of excess or undesirable solder from printed circuit boards that may contain through-holes, conductors, connectors, etc. This is accomplished by covering such boards with liquid flux, contacting with liquid solider, removing from the solder, and subsequently passing intermediate offset,

hot gas jets which flow hot gas under pressure onto the boards and sweep off undesired solder, clear the holes, and leave an optimum thickness solder layer.

PATENT-3 887 365

Not available NTIS

National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

Process for Making Sheets with Parallel Pores of Uniform Size.

Patent.

J. M. Sherley. Patented 3 Jun 75, 8p PAT-APPL-127 480

Misc-Filed 24 Mar. 1971 Supersedes N71-34427 (09-21, p 3433).

Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Forming techniques, *Metal sheets, *Porosity, *Production engineering, Extruding, Filament winding, Metal powder, Metals, *Patents.

Identifiers: PAT-CL-75-214.

Processes for making sheets with parallel pores of uniform size are described. In one form, the process comprises the steps of: extruding a slurry formed of short, nonmetallic filament pieces, a metal powder, water, and a plasticizer through a suitable orifice to align the filament pieces parallel to one another; cutting the extrusion into suitable sections; stacking the sections in parallel in a refractory container; compacting the stack; heating the stack in a reducing atmosphere; compacting while hot, if necessary; slicing, at right angles to the longitudinal axis of the original sections, the thusly formed billet into sheets; and leaching out the filament pieces in each sheet. In a alternate form, a continuous filament was used. The continuous filament is drawn through a slurry containing metal powder which may include a solder, water and a plasticizer rather than being extruded through an orifice. In a still further form, the continuous coated filament is wound onto a suitably shaped spool.

PATENT-3 889 122

Not available NTIS

National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

Method of Determining Bond Quality of Power Transistors Attached to Substrates.

Patent.

T. A. Telfer. Patented 10 Jun 75, 4p PAT-APPL-464 721

Misc-Filed 26 Apr. 1974 Supersedes N74-21858 (12- 13, p 1527). Subm-Sponsored by NASA.

Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Joints (Junctions), *Junction transistors, *Microstructure, *X ray inspection, Nondestructive tests, *Patents, Quality control, Structural stability, Substrates.

Identifiers: PAT-CL-250-359.

A method of determining the quality of the bond between a power transistor and an electrically insulative, heat conductive substrate is described; the method takes X ray exposure of the bond. In the exposures, the areas where the bond quality is poor show up as dark in relation to a lighter background area where the bond quality is good. The exposures are tested in a light meter device in which the average transparency of on exposure indicates the percentage of voids, or poorly bonded areas. Only those units having less than a predetermined percentage of voids are acceptable.

PB-243 666/5GA PC$4.25/MF$2.25

British Steel Corp., Sheffield (England). Information Services.

The Continuous Casting of Steel. A Bibliography of the Literature for 1973,

D. G. Brinn. Jun 75, 53p SM/TN/1/43

Descriptors: *Continuous casting, *Bibliographies, Steels, Steel making, Great Britain.

The bibliography consists of 231 annotated references to the literature on continuous casting published during 1973. A subject index, company index and author index are included.

PB-243 674/9GA PC$3.75/MF$2.25

British Steel Corp., Sheffield (England). Information Services.

Node Joint Fabrication in Fixed Offshore Production Platforms,

J. G. Garland, P. R. Kirkwood, and J. R. Still. Jun 75, 35p GS/PROD/MISC/98/74/C

Descriptors: *Offshore structures, *Welding, *Welded joints, Fabrication, Steel structures, Great Britain.

The extended life expectancy of the present generation of fixed offshore platforms depends upon the integrity of the nodal regions of the fabricated steel jacket and this has led to stringent material, fabrication and inspection standards in these critical areas. The resultant constraints placed upon the choice of steel from considerations both of formability and weldability are outlined, together with the background to the selection of welding consumables capable of producing joints with the enhanced levels of mechanical properties and freedom from defects demanded. Practical aspects of mode barrel fabrication and the assembly of complete nodal joints are discussed in detail.

RFP-1827 PC$4.00/MF$2.25

Dow Chemical U.S.A., Golden, Colo. Rocky Flats Div.

Development and Pilot Production of Three Ingot-Source Beryllium Sheet Metal Parts.

D. R. Floyd. 7 May 75, 18p

Contract AT(29-1)-1106

Descriptors: (*Beryllium, *Fabrication), Heat treatments, Mechanical structures, Recrystallization, Sheets, Temperature dependence, Tensile properties, Time dependence.

For abstract, see NSA 32 03, number 07023.

SAND-75-0192 PC$4.00/MF$2.25

Sandia Labs., Albuquerque, N.Mex.

Preparation of Damage-Free Surfaces of Metal Single Crystals for Ion Channeling.

R. G. Swier. Apr 75, 14p

Contract AT(29-1)-789

Descriptors: (*Aluminium, *Polishing), (*Chromium, Polishing), (*Copper, Polishing), (*Molybdenum, Polishing), Ion channeling, Monocrystals, Tungsten.

For abstract, see NSA 32 03, number 07024.

UCRL-76878 PC$4.00/MF$2.25

California Univ., Livermore Lawrence Livermore Lab.

Adiabatic Surface Thermometer for Improved Production Braze Quality.

G. R. Dittbenner. 25 Mar 75, 10p CONF-750446-1

Descriptors: (*Brazing, *Automation), (*Thermocouples, *Fabrication), Adiabatic processes, Brittleness, Metals.

For abstract, see NSA 32 03, number 07025.

13I. Machinery and Tools

N75-26374/9GA PC$4.25/MF$2.25

California State Univ., Northridge.

Stresses in a Webbed Ball.

Final Report.

L. J. Nypan. Jun 75, 52p NASA-CR-2562

Contract NGL-05-062-002

Descriptors: *Ball bearings, *Strain gages, *Stress analysis, Fatigue life, Graphs (Charts), Static loads, Stress concentration, Tables (Data).

For abstract, STAR 1317

N75-26375/6GA PC$3.75/MF$2.25

National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

Dynamic Capacity and Surface Fatigue Life for Spur and Helical Gears.

J. J. Coy, D. P. Townsend, and E. V. Zaretsky. 1975, 38p NASA-TM-X-71743, E-8273

Conf-Presented at the Joint Lubrication Conf., Miami, Fla., 21-23 Oct. 1975; Sponsored Jointly by the AM. Soc. Of Lubrication Eng. And Asme.

Descriptors: *Dynamic loads, *Fatigue life, *Gear teeth, Electric power transmission, Failure analysis, Gears, Mathematical models, Mechanical engineering, Roller bearings.

For abstract, STAR 1317

N75-26377/2GA PC$3.75/MF$2.25

National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

A Life Study of Ausforged, Standard Forged and Standard Machined AISI M-50 Spur Gears.

D. P. Townsend, E. N. Bamberger, and E. V. Zaretsky. 1975, 33p NASA-TM-X-71748, E-8258

Descriptors: *Ausforming, *Forging, *Gears, *Stainless steels, Arc melting, Bending fatigue, Fatigue life, Gear teeth, Vacuum melting.

For abstract, STAR 1317

PAT-APPL-508 013/GA PC$3.25/MF$2.25

Department of the Interior, Washington, D.C.

Magnetic Ore Separator.

Patent Application,

Roger W. Boom, Yehia M. Eyssa, and John (NMI) Sutton. Filed 20 Sep 74, 17p

DOCKET/MIN-2195

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Magnetic separators, *Patent applications, Minerals, Beneficiation, Magnetic fields, Slurries.

The patent application relates to magnetic separation of minerals, and more particularly to a separation in a continuous fluidized particulate feed thereof of magnetic particles, including weakly magnetic constituents, from nonmagnetic particles by turbulently streaming the feed through a high intensity magnetic field applied thereto.

PAT-APPL-576 757/GA PC$3.25/MF$2.25

Department of Agriculture, Washington, D.C.

Helical Head Comminuting Shear.

Patent Application,

Robert D. Barwise. Filed 12 May 75, 11p

Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Grinding mills, *Patent applications, Shears, Comminution, Wood, Cutters, Curves(Geometry).
Identifiers: PAT-CL-241-83.

The patent application describes a cutting machine which reduces naturally formed and partially processed wood into particles of controlled length and cross-sectional dimensions. A spiral cutting edge mounting on a drive shaft is of varying radial length increasing from zero on one end to a maximum length and then gradually decreasing back to a minimal radial length on the other end. An anvil is provided under the front or shearing section against which the rotating spiral shears the wood. In the back or degradation section a casing in the shape of a truncated cone is fitted around the decreasing spiral. Wood is fed parallel to the drive shaft into the front end of the apparatus. The rotating cutting edge contacts the log at regular intervals thus creating wood particles of close length tolerance which then pass through the degradation cone where, due to the decreasing diameter and positive feed, the particles are compressed and abraded before passing through openings of measured cross-sectional area.

PAT-APPL-590 182/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Thrust Bearing.
Patent Application.
W. J. Anderson. Filed 25 Jun 75, 13p NASA-CASE-LEW-11949-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Gas bearings, *Thrust bearings, Load distribution (Forces), *Patent applications, Thrust loads.

A gas-lubricated thrust bearing is described which employs relatively rigid inwardly cantilevered spokes carrying a relatively resilient annular member or annulus. This annulus acts as a beam on which are mounted bearing pads. The resilience of the beam mount causes the pads to accept the load and, with proper design, responds to a rotating thrust-transmitting collar by creating a gas film between the pads and the thrust collar. The bearing may be arranged for load equalization thereby avoiding the necessity of gimbal mounts or the like for the bearing. It may also be arranged to respond to rotation in one or both directions.

PATENT-3 744 369 Not available NTIS
Department of the Army Washington D C
Thermite Cable Cutter.
Patent,
Samuel J. Marziano, and John Revell. Filed 16 Jul 71, patented 10 Jul 73, 3p Rept nos. PAT-APPL-163 162,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cable cutting devices, *Patents, Thermite.
Identifiers: PAT-CL-89-1-B.

The patent describes an apparatus and method for severing a steel cable. It comprises a housing having an upper reservoir and a lower work piece holder component, a flow gate extending downward from the reservoir through the work piece holder, port means positioned at the bottom of the housing, whereby on the ignition of the thermite mixture in the reservoir component, the resultant molten mass contacts the steel cable positioned in the work piece holder for a short period of time, thereby severing the cable.

13J. Marine Engineering

AD-A013 599/6GA PC$3.75/MF$2.25
Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Flow Observations and an Analysis of Velocity Survey Data for a United States Coast Guard WYTM Represented by Model 5336,
Rae B. Hurwitz, and E. E. West. Jul 75, 35p Rept no. SPD-223-15

Descriptors: *Icebreakers, *Ship hulls, *Propellers(Marine), Performance tests, Hydrodynamics, Fluid flow, Harmonic analysis, Velocity, Model tests, Ship models, Wake, Open water, Sea testing, Flow fields, Tables(Data).
Identifiers: Design, Velocity Component Ratios.

A velocity survey experiment was conducted with a model representing a United States Coast Guard WYTM. Values of longitudinal and tangential velocity component ratios are included herein. A harmonic analysis of the circumferential distribution of the longitudinal and tangential velocity component ratios was performed. The results are presented herein and are considered valid. Experiments were conducted to determine flow patterns about under water portion of hull. Photographs show separation above propeller. (Author)

AD-A013 603/6GA PC$4.75/MF$2.25
Mar Inc Rockville Md
A Conceptual Study of the Factors Involved in Installation, Operation, and Recovery of Moors with Attached Bottom-Mounted Sensors.
Final rept.,
Shelton M. Gay, Jr. Jul 75, 97p Rept no. MAI-05-75-001
Contract N00014-74-C-0310

Descriptors: *Mooring, *Remote detectors, Underwater equipment, Failure(Mechanics), Ocean bottom, Deep oceans, Installation, Handling, Anchors(Marine), Mooring buoys, Launching, Free fall, Emplacement, Recovery, Cables, Stability, Torsion, Spinning(Motion), Strumming, Instrumentation, Hydrodynamic configurations, Load distribution, Spatial distribution, Buoyancy, Drag, Twist(Motion), Algorithms, Computer aided design.

A conceptual study is reported of potential failure mechanisms associated with installation, operation and recovery of deep-sea buoy moors with attached bottom-mounted sensors. The study is directed to the 'anchor-last' mode of installation. The effects considered include, among others, initial launch geometry, stability characteristics of the components (including torsional characteristics of the cables, both internally and externally generated), relation of the outlying instrument leads to the mooring riser, spin-stability of objects suspended by multiple lines and hydrodynamic effects such as strum and component rotation. The length of the instrument leads in relation to the depth is identified as an important parameter. The utility of modeling and the status of algorithms useful in the design of deep-sea mooring installations are discussed. A general installation procedure is suggested.

AD-A013 635/8GA PC$3.25/MF$2.25
Office of Naval Research London (England)
The 'Hydropulser', A New Idea for Propulsion,
Harold G. Elrod. 18 Jun 75, 19p Rept no. ONRL-9-75

Descriptors: *Marine surface propulsion, *Water jets, Pumps, Pumping, Hydrodynamics, Thrust, Performance(Engineering).
Identifiers: *Hydropulsers.

This report describes in detail the Hydropulser, a patented invention of Olivier de la Roche Kerandraon. This device furnishes a new way to pump water or to propel ships. The report contains schematics of the Hydropulser as well as a complete description of its development and performance.

AD-A013 641/6GA PC$4.25/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md
Experimental Investigation of Catamaran Cross-Structure Slamming,
Sheng-Lun Chuang, John T. Birmingham, and Anthony J. Furio, Jr. Sep 75, 55p Rept no. NSRDC-4653

Descriptors: *Catamarans, *Ship hulls, *Structural engineering, *Slamming, Loads(Forces), Dynamic pressure, Model tests, Pitch(Motion), Heaving, Waves, Deformation, Impact prediction.
Identifiers: *Load criteria, *Structural design, AGOR 16 vessel.

A model of a conventional catamaran was tested in regular head waves at the Naval Ship Research and Development Center to investigate the cross-structure slamming phenomenon. The severity of slamming was found to be determined principally by the relative motions resulting from the ship's pitch and heave and the relations of these motions with the impacting wave surface. The impact pressure prediction method that was developed on the basis of these findings gave results that agreed reasonably well with the data from model tests and full-scale sea trials on USNS HAYES (T-AGOR-16). Spatial averages of impact pressures obtained from the model and full-scale data provide pressure-area relations for use in determining load criteria for cross-structure bottom plate, panel, and grillage design. The effect of deformability of impact surfaces was also investigated and the results used to provide guidance in the development of load criteria for the structural design of the cross structure in the slamming area.

AD-A013 807/3GA PC$10.00/MF$2.25
Rhode Island Univ Kingston Dept of Ocean Engineering
Modeling System for Vessels in Ice.
Doctoral thesis,
George P. Vance. Jun 75, 367p USCG-D-151-75

Descriptors: *Ship models, *Ice penetration, Model tests, Scale models, Hydrodynamics, Test facilities, Accuracy, Fresh water, Salt water, Mathematical models, Equations, Methodology, Assessment, Friction, Ships, Icebreakers, Flexural strength, Velocity, Research management, Regression analysis, Data processing, Theses.
Identifiers: Sea ice breaking.

The report covers the existing methods utilized in scaling model data for vessels in ice to the full scale regime. It reviews the properties of model and full scale ice. The main thrust of the report is the development of a procedure for testing vessels in model ice and scaling the results to the full scale regime with an accuracy of plus or minus 10 percent. The second section of the report discusses the design of a test facility to conduct icebreaking and hydrodynamic model tests. All the data collected and utilized are contained in appendices to the report.

AD-A013 988/1GA PC$3.25/MF$2.25
Naval Ship Research and Development Center Bethesda Md Ship Performance Dept
Powering Predictions for the United States Coast Guard 140-Foot WYTM (Model 5336 - Propeller 4657),
K. D. Remmers, and Richard Hecker. Jul 75, 14p Rept no. SPD-223-18

Descriptors: *Icebreakers, Ship hulls, Hydrodynamics, Marine surface propulsion, Model tests, Performance, Displacement.
Identifiers: WYTM vessels.

The report presents powering predictions for a WYTM with design propeller. The ship is predicted to attain a speed of 14.9 knots in smooth deep, fresh water. Little or no thrust breakdown is expected in the bollard conditions with the design propeller.

AD-A014 078/0GA PC$4.25/MF$2.25
David W Taylor Naval Ship Research and Development Center Bethesda Md
Functional Description for the Integrated Ship Design System (ISDS),
Jack Brainin. Apr 75, 59p Rept no. NSRDC-4663

Descriptors: *Ships, *Computer aided design, Ship hulls, Ship structural components, Systems engineering, Data management, Computer graphics, Naval planning, User needs.
Identifiers: ISDS project, CASDAC project.

A phased approach has been taken in the development of the Integrated Ship Design System. Mod 0 was developed as a prototype model to test the feasibility of creating an integrated system for ship design use. Mod 1 is currently being developed for use as a production tool in the Naval Ship Engineering Center. This functional description for the Integrated Ship Design System (ISDS) project provides a basis for mutual understanding among the ISDS Committee members representing both the users and developers of the system, and provides information on performance requirements, conceptual/preliminary design, and user impacts.

COM-75-10985/0GA PC$3.25
Scripps Institution of Oceanography, La Jolla, Calif.
Ancient and Modern Harbors: A Repeating Phylogeny (Chapter 119),
Douglas L. Inman. Jun 74, 20p NOAA-75061919
Grant NOAA-04-3-158-22
Pub. in Proceedings of the Coastal Engineering Conference (14th), Copenhagen, Jun 74.

Descriptors: *Harbors, *Coastal engineering, Breakwaters, Wharves, Quays, Aegean Sea, Archaeology.
Identifiers: Sea Grant program.

The Minoans and Phoenicians appear to have developed a very superior 'lay' understanding of waves and currents, which led to the development of remarkable concepts in working with natural forces in their coastal engineering works. For example, the Phoenicians developed a 'continuous self-flushing' harbor at Tyre and possibly a flushable harbor for the removal of sand and silt at Sidon. It would appear that developments of this type were the outgrowth of the close association with and acute observation of nature that occurs where a coastal people learn to work with currents and sail, in the absence of technology for harnessing large amounts of power. However, harbor design became markedly stereotyped following the development of large engineering corps with the capacity for rapid and massive construction. The earlier innovative, natural concepts in harbor design appear to have become obscured by the end of the Roman era, and have remained relatively unused to this day. In view of man's present extensive intervention in the coastal zone, a careful study of the ancients' ability to work with nature may provide valuable insight for today's problems.

COM-75-11042/9GA PC$3.75/MF$2.25
Mississippi-Alabama Sea Grant Consortium, Ocean Springs, Miss.
Natural and Artificial Reefs in Mississippi Coastal Waters: Sport Fishing Pressure and Economic Considerations,
Donnie L. Daniel, and Joe E. Seward. 1975, 34p
MASGP-75-007 NOAA-75070103
Prepared by University of Southern Mississippi, Hattiesburg. Bureau of Business Research.

Descriptors: *Reefs, *Recreation, *Fishing, *Mississippi Sound, Fish economics, Feasibility, Fisheries, Fish resources, Surveys, Benefit cost analysis, Coasts, Recommendations, Economic analysis.
Identifiers: Sea Grant program, Sport fishing, Artificial reefs.

The study represents the initial research effort in an attempt to assess the sport fishing pressure at existing artificial and natural reefs in the Mississippi Sound. Activities are already underway to develop new artificial fishing reefs in that area. Hopefully, this study will provide some useful input toward an efficient utilization of scarce resources for that purpose. The purpose of this project is twofold: (1) It provides estimates of the fishing pressure on various types of artificial and natural fishing reefs in the Mississippi Sound; and (2) it provides some economic guidelines which should prove useful in determining the feasibility of artificial reefs.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

AD-A013 608/5GA PC$3.75/MF$2.25
Naval Postgraduate School Monterey Calif
The Effect of a Plane Boundary on Wave Induced Forces Acting on a Submerged Cylinder.
Master's thesis,
Houston Keith Jones. Jun 75, 44p

Descriptors: *Pipelines, *Ocean bottom, *Ocean waves, *Underwater objects, *Cylinders, Ocean waves, Fluid flow, Force(Mechanics), Offshore drilling, Ocean currents, Hydrostatic pressure, Electric cables, Stresses.
Identifiers: Petroleum pipelines.

The in-line and transverse forces acting on cylinders of 1.0 inch to 2.5 inches diameter placed near a plane wall in a harmonically oscillating flow have been measured. The drag and inertia coefficients C sub d and C sub m for the in-line force and the lift coefficients C sub 1A and C sub 1T for the transverse forces away and toward the wall, respectively, have been determined as a function of the relative gap e/D between the wall and the cylinder and the period parameter V sub m T/D. The relative gap ranged from 0.0143 to unity and the period parameter from zero to 35. In the subcritical range where these experiments have been performed, the effect of the Reynolds number, which ranged from 4,000 to 30,000, was found to be secondary and certainly obscured by the excellent correlation provided by the period parameter. The frequency of the transverse force was found to range from one to five times the frequency of oscillation of the harmonic motion, but a dominant frequency of twice the oscillation frequency was seen over most of the values of V sub m T/D.

HEDL-SA-748 PC$4.50/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Mechanical Properties of Roll Extruded Nuclear Reactor Piping.
J. M. Steichen, and R. L. Knecht. Jan 75, 29p
Contract AT(45-1)-2170

Descriptors: (*Stainless steel-316, *Mechanical properties), (*Fftf reactor, *Pipes), Coolants, Cracks, Ductility, Extrusion, High temperature, Liquid metals, Reactor components, Rolling, Sodium, Strains, Surface properties, Time dependence.

For abstract, see NSA 32 03, number 07049.

PATENT-3 161 399 Not available NTIS
Department of the Army Washington D C
Stop Valve Mechanism.
Patent,
Paul I. Evans. Filed 19 Sep 61, patented 15 Dec 64, 4p Rept nos. PAT-APPL-139 828,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Check valves, *Patents, Hydraulic equipment, Hydraulic servomechanisms, Bleed systems, Hydraulic valves.
Identifiers: PAT-CL-251-14.

The invention relates to valve mechanisms for controlling the flow of fluids, and more particularly to an improved valve mechanism which operates automatically to interrupt the flow of a fluid in response to a decrease of the fluid pressure in its outlet circuit.

PB-243 133/6GA PC$4.75/MF$2.25
Hawaii Univ., Honolulu. Dept. of Agricultural Engineering.
Computer Assisted Design of Diverging Branch Fluid Network: A Dynamic Programming Approach.
Master's thesis,
Kwang-Ping Yang. Dec 73, 94p W75-09124, OWRT-B-029-HI(1)

Descriptors: *Pipes(Tubes), *Pipe flow, *Computer aided design, Pipeline transportation, Piping systems, Distribution systems, Dynamic programming, Theses, Computer programs, FORTRAN.

The dynamic programming technique has been successfully applied previously in solving serial type fluid systems. This technique was expanded to application to nonserial diverging branch type fluid networks. An interactive computer program based on a more efficient optimization method was developed. Pressure loss between pipe segments due to change of conduit sizes was incorporated into the design. The computer program was discussed with flow charts and a sample run of the program was presented. Results from this example demonstrated that the dynamic programming method is applicable to the solution of diverging branch type fluid system problems. Appendixes contain the FORTRAN listing of the program and the program output for the sample run.

UCRL-76038 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Use of Probabilistic Techniques in Designing Pipes and Pressure Vessels.
J. E. Wells. 17 Dec 74, 19p CONF-750617-12

Descriptors: (*Pipes, *Design), (*Pressure vessels, Design), Fracture properties, Reliability, Statistical models, Tensile properties.

For abstract, see NSA 32 03, number 06242.

13L. Safety Engineering

COM-75-11030/4GA PC$3.25/MF$2.25
National Bureau of Standards, Washington, D.C. Center for Fire Research.
A Small-Scale Enclosure for Characterizing the Fire Buildup Potential of a Room.
Final rept.,
W. J. Parker, and B. T. Lee. Jun 75, 24p NBSIR-75-710
Sponsored in part by Naval Sea Systems Command, Washington, D.C.

Descriptors: *Fire safety, *Buildings, Fires, Heat flux, Thermal radiation, Flashover, Model tests, Fire tests, Mathematical prediction, Research.
Identifiers: Rooms.

A 0.76 by 0.76 m (30 by 30 inch) enclosure with a 0.61 m (24 inch) high ceiling was used to model some fires in a 3 x 3 x 2.4 m (10 x 10 x 8 ft) burnout room. Temperatures, oxygen concentrations, air velocity, and conductive and radiative heat fluxes were measured. The highest average air temperature in the upper part of the room was taken as a measure of the fire buildup potential of the room. Upper air temperatures attained in the model were similar in most cases to those in the full-scale compartment. From energy balance considerations this air temperature was related to the oxygen depletion in the room and was shown to correlate well with the oxygen content of the combustion gas and air exhausting from the model and full-scale room fires.

NTIS/PS-75/660/1GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Pedestrian Movement and Safety (A Bibliography with Abstracts).
Rept. for 1968-Jul 75,
Mary E. Young. Aug 75, 101p*
Supersedes NTIS/PS-75/006.

Descriptors: *Pedestrian movement, *Bibliographies, *Safety, Motor vehicles, Accidents, Injuries, Casualties, Traffic safety, Accident prevention, Behavior, Structural design, Children, Vehicular traffic control, Intersections.

Reports on the movements of pedestrians and techniques for their protection in traffic systems are abstracted in the bibliography. Included are pedestrian safety standards, accidents involving pedestrians, and construction and traffic design related to pedestrian movement and safety. (Contains 96 abstracts)

NTIS/PS-75/683/3GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Disasters (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Mary E. Young. Sep 75, 172p*
Supersedes NTIS/PS-75/007.

Descriptors: *Disasters, *Bibliographies, Emergency planning, Warning systems, Survival, Civil defense, Damage assessment, Casualties, Regional planning, Rescue operations, Urban areas, Rural areas.

Reports cited in the bibliography include emergency planning, communications and transportation systems, and damage recovery in disasters other than nuclear. Also included are reports on individual and organizational stress under emergency conditions, and the potential use of satellites to predict natural disasters. (Contains 167 abstracts)

PAT-APPL-571 180/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Fire Prevention System.
Patent Application,
Filed 24 Apr 75, 19p DOCKET/MIN-2323
Also available as DOCKET/MIN-2324, DOCKET/MIN-2325, and DOCKET/MIN-2326.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Fire protection, *Fire detection systems, *Patent applications, Fire extinguishers, Automatic, Reliability, Mine haulage, Motor trucks.

The patent application relates to an automatic fire prevention system which provides failsafe features as well as the capability of checking the operation of associated fire sensors. Multiple fire sensors, including thermal and optical types, are continually checked by a test circuit which simulates fire conditions. Detection of an actual fire causes an automatic control circuit, after a predetermined time delay, to activate a fire extinguishing device such as a dry powder chemical extinguisher. Logic circuitry distinguishes between true fires and fires simulated by the aforementioned test circuit. An operator can by-pass the automatic activation of the fire extinguishing device by means of a manual switch during the time delay period and can also manually discharge the fire extinguisher. Applications include the protection of mine haulage trucks so as to provide automatic fire extinguisher activation, continued self-checking and manual override features for a driver.

PB-243 597/2GA PC$3.75/MF$2.25
National Transportation Safety Board, Washington, D.C. Bureau of Surface Transportation Safety.
Deaton Company Incorporated, Truck/Automobile Collision, Chattahoochee River Bridge, I-20, Atlanta, Georgia, August 21, 1973.
Highway accident rept.
21 May 75, 34p NTSB-HAR-75-4

Descriptors: *Motor vehicle accidents, *Accident investigations, Collision research, Interstate highway system, Traffic congestion, Highway bridges, Traffic safety, Design standards, Land use.
Identifiers: DOT/5A, DOT/4DZ/DB.

The report describes and analyzes the collision between a truck and an automobile on the Chattahoochee River Bridge (I-20) near Atlanta, Georgia, on August 21, 1973. The crash occurred on a section of Interstate highway which, at the time of the accident, was congested. Heavy traffic was exiting the Interstate to 'Six Flags Over Georgia' -- a recreational attraction in the southeast quadrant of the interchange area. Of the five occupants in the automobile, the driver and three passengers died. The truckdriver was not injured. The National Transportation Safety Board determines that the probable cause of this accident was the failure of the driver of the car to control her automobile while attempting to avoid unexpected slower moving vehicles ahead. Her failure resulted in an erratic move to the left and into the path of the overtaking truck. Contributing to the accident were unexpected traffic congestion which required a hazardous stop in the right lane, and land-use practices that permitted the generation of traffic in excess of the safe and efficient operating capacity of the roadway.

PB-243 598/0GA PC$3.75/MF$2.25
National Transportation Safety Board, Washington, D.C. Bureau of Surface Transportation Safety.
Hazardous Materials Accident at the Southern Pacific Transportation Company's Englewood Yard in Houston, Texas, September 21, 1974.
Railroad accident rept.
21 May 75, 41p NTSB-RAR-75-7

Descriptors: *Railroads, *Accident investigations, Collision research, Rail transportation, Hazardous materials, Railroad cars, Tank cars, Railroad terminals, Butadienes, Explosions.
Identifiers: DOT/5A, DOT/4DZ/DC, *Railroad accidents.

About noon on September 21, 1974, 2 loaded 'jumbo' tank cars, cars 17 and 18 of a 145-car complement, were uncoupled as a unit at the crest of the gravity hump in the Southern Pacific Transportation Company's (SP) Englewood Yard at Houston, Texas. The two cars passed through the hump master retarder and group retarder without being slowed and accelerated as they moved down the grade into bowl track 1. At a speed of 18 to 20 mph, the two tank cars impacted an empty tank car. Upon impact, the coupler of the empty tank car rode over the coupler of car 17 and punctured the tank head. Butadiene spilled from the car and formed a vapor cloud, which dispersed over the area. After 2 to 3 minutes, the vapor exploded violently; as a result, 1 person died and 235 were injured. Total damages amounted to about $13 million, which included the destruction of 231 railroad cars and substantial damage to 282 others.

PB-243 848/9GA PC$7.00/MF$2.25
Abt Associates, Inc., Cambridge, Mass.
A Systematic Program to Reduce the Incidence and Severity of Bathtub and Shower Area Injuries: Final Report.
Final rept.,
Robert F. Stone, Deborah J. Blackwell, and Daniel J. Burton. 4 Jun 75, 178p* CPSC/BES-75/01
Contract CPSC-P-74-334
See also PB-243 849.

Descriptors: *Consumer products, *Product safety, *Home accidents, *Accident prevention, Skid resistance, Surface properties, Children, Injuries, Accident investigations, Cost effectiveness, Publicity, Consumer relations.
Identifiers: *Bathtubs, *Showers, *Bathroom products, Elderly persons.

Contents:
Accident scenarios;
Intervention strategies;
Economic analysis;
Videotaping activities;
Bathtub/shower area safety conference;
Recommendations and other intervention strategies to be considered. Portions of this document are not fully legible.

PB-243 849/7GA PC$3.25/MF$2.25
Abt Associates, Inc., Cambridge, Mass.
A Systematic Program to Reduce the Incidence and Severity of Bathtub and Shower Area Injuries: Executive Summary.
Final rept.,
Robert F. Stone, Deborah J. Blackwell, and Daniel J. Burton. 4 Jun 75, 14p* CPSC/BES-75/02
Contract CPSC-P-74-334
See also PB-243 848.

Descriptors: *Consumer products, *Product safety, *Home accidents, *Accident prevention, Skid resistance, Surface properties, Children, Injuries, Accident investigations, Cost effectiveness, Publicity, Consumer relations.
Identifiers: *Bathtubs, *Showers, *Bathroom products, Elderly persons.

Injury data from Consumer Product Safety Commission National Electronic Injury Surveillance System was analyzed to determine the frequency and severity of bathtub and shower area injuries and the chain-of-events surrounding the accidents. Remedial designs were developed for 17 high-priority accident scenarios and each design was evaluated for cost-effectiveness. The best remedial designs were recommended for new or retrofit applications.

13M. Structural Engineering

AD-A013 987/3GA PC$4.75/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss

Evaluation of Expedient Techniques for Strengthening Floor Joist Systems in Residential Dwellings.
Final rept. Aug 73-May 74,
Michael S. Black. Jul 75, 84p Rept no. AEWES-Misc-Paper-N-75-6
Contract DAHC20-68-W-0192

Descriptors: *Buildings, *Floors, *Supports, Shelters, Structural members, Reinforcing materials, Construction, Plywood, Civil defense.
Identifiers: *Expedient construction, *Residential buildings, *Joists.

Expedient techniques for reinforcing wood floor joist systems were evaluated by building 15 test specimens and subjecting them to static tests in a 200-kip loader. Each specimen consisted of three 2- by 10-inch by 16-foot floor joists (16 inches on center). Two sheets of 4- by 8-foot by 3/4-inch plywood and two sheets of 4- by 8-foot by 1/4-inch Masonite were centered and nailed to the joists. A 2- by 10-inch by 4-foot header board was nailed to each end of the floor specimen. Unreinforced and reinforced floor specimens were tested. Tl.e expedient techniques of joist reinforcement evaluated were: (1) 1-1/2-inch by 16-foot by 1/8-inch steel strap nailed to the bottom of the joists, (2) 4- by 8-foot by 1/4-inch plywood nailed to the bottom of the joists, (3) U-shaped hanger straps bolted around the joists, (4) combination of the hanger straps and 1-1/2-inch by 16-foot by 1/8-inch steel strap, and (5) 22-gage galvanized steel strap nailed to the bottom of the joists.

CONF-750617-3 PC$4.50/MF$2.25
Oak Ridge National Lab., Tenn.
Elevated-Temperature Tests of Simply-Supported BEAMS and Circular Plates Subjected to Time-Varying Loadings.
J. M. Corum, and M. Richardson. 1975, 30p

Descriptors: (*Building materials, *Deformation), (*Plates, Deformation), Elasticity, High temperature, Plasticity, Strains, Stresses.

For abstract, see NSA 32 03, number 06232.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-A013 580/6GA PC$6.25/MF$2.25
Transportation Systems Center Cambridge Mass
The Development of an Experimental Airborne Laser Remote Sensor for Oil Detection and Classification in Spills.
Final rept.,
John F. Fantasia, and Hector C. Ingrao. Feb 75, 164p Rept no. TSC-USCG-74-5 USCG-D-86-75
Contract DOT-PPA-CG-03

Descriptors: *Oil pollution, *Water pollution, *Fluorometers, *Lasers, *Remote detectors, Classification, Chemical analysis, Fluorescence, Laboratory tests, Field tests.
Identifiers: Oil spills, *Oil pollution detection, *Remote sensing, DOT/5C, DOT/4IZ/IE.

A study and measurements program to determine the feasibility of using laser-excited oil fluorescence as a means of detecting and classifying oils in spills in the marine environment was undertaken at the DOT/Transportation Systems Center. The study consisted of an analysis of the fluorescence properties of oils and oil slicks on the sea surface, and a theoretical analysis of the remote fluorometry of oil spills. As a result of this study a laboratory and field measurements program was undertaken. Laboratory measurements were made of 29 crude and refined oils commonly transported in the marine environment. These measurements included API gravity, fluorescence and reflectance spectra, fluorescence coefficient and fluorescence lifetimes. Similar measurements were made with a laboratory model of an N2 laser oil spill remote sensor. Results of these measurements showed that, under certain conditions, oil spill detection and classification can be made in the marine environment.

AD-A013 594/7GA PC$4.25/MF$2.25
Naval Ordnance Lab White Oak Md
A Hydraulic Inclinometer, Linear Accelerometer and Angular Accelerometer.
Final rept.,
W. P. Christoph. 16 Dec 74, 65p Rept no. NOLTR-74-196

Descriptors: *Accelerometers, *Ocean currents, Mooring, Hydraulic equipment, Fluids, Angular acceleration, Viscosity, Thermistors, Mass, Dual mode, Response, Motion.
Identifiers: Inclinometers.

An inclinometer, a linear accelerometer and an angular accelerometer are described. All devices utilize fluid as masses, the resiliency of bellows as restoring force and the fluid's viscosity for damping and hydraulic resistance. All devices use a pair of thermistor beads in a Wheatstone bridge as sensing elements for small fluid displacements. The generation of the required functions is dependent on the usage and/or design of the three devices above. Appendix A, by L. A. Vendetti, is a description of the electronic circuitry associated with the thermistor bridge. In Appendix B, A. G. Rozner investigated the applicability of the new device for motion measurements of moored cylindrical bodies; and in Appendix C, the applicability of the new devices for the measurement of forces acting on a moored body. (Author)

AD-A013 607/7GA PC$4.25/MF$2.25
Naval Postgraduate School Monterey Calif
An Expendable Measuring Device for Light Attenuation in the Ocean.
Master's thesis,
Glen Dean Snyder. Jun 75, 57p

Descriptors: *Photometers, *Fluxmeters, Underwater light, Attenuation, Expendable, Underwater equipment, Photoelectric cells(Semiconductor), Sea water, Transparence, Visibility, Light transmission, Diffusivity, Coefficients, Light scattering, Turbidity, Optical communications, Optical detectors, Mathematical prediction, Feasibility studies, Low costs, Naval equipment, Theses.
Identifiers: Design.

The feasibility of an inexpensive expendable device for determining the diffuse attenuation coefficient k for downwelling irradiance in ocean waters is investigated. A suggested instrument for such measurements in a modified standard US Navy Expendable Bathythermograph (XBT) probe used in conjunction with an unmodified launcher and recorder. Information gained from such a device would rapidly supplement existing inadequate data and could be utilized by tacticians in determining the capabilities of underwater optical systems to a higher degree of certainty than presently possible. In addition such a probe could be used by fisheries biologists to calculate euphotic depths and to improve standing phytoplankton crop estimates. (Author)

AD-A013 620/0GA PC$7.50/MF$2.25
Physics International Co San Leandro Calif
TEMPS (Transportable EMP Simulator) Final Report. Volume I.
Rept. for 1 Sep 71-16 Oct 72,
H. Aslin, and R. Ryan. Aug 73, 23p Rept no. PIFR-372-D-Vol-1
Contract DAAK02-72-C-0059
Sponsored in part by Defense Nuclear Agency, Washington, D.C. See also Volume 2, AD-A013 621.

Descriptors: *Simulators, Electromagnetic pulses, Pulse generators, Transportable, Antennas.
Identifiers: *Transportable electromagnetic pulse simulators.

This report presents a description of the development, design, fabrication, and field testing of the TEMPS (Transportable EMP Simulator). The basic system is a simulator with the geometry of a cylinder parallel to the ground surface driven at its center by a high voltage capacitive pulser and terminated resistively at its ends to ground. The pulser and cylindrical antenna are supported by means of a dielectric support structure at elevations of up to 20 meters measured from the antenna/pulser centerline to ground. Essentially, TEMPS has three individual subsystems: the pulse generator, the cylindrical antenna, and the support structure.

AD-A013 621/8GA PC$7.25/MF$2.25
Physics International Co San Leandro Calif
TEMPS (Transportable EMP Simulator) Final Report. Volume II. Appendixes.
Rept. for 1 Sep 71-16 Oct 72,
H. Aslin, and R. Ryan. Aug 73, 220p Rept no. PIFR-372-D-Vol-2
Contract DAAK02-72-C-0059
Sponsored in part by Defense Nuclear Agency, Washington, D.C. See also Volume 1, AD-A013 620.

Descriptors: *Simulators, Electromagnetic pulses, Pulse generators, Transportable, Capacitors, Resistors.
Identifiers: *Transportable electromagnetic pulse simulators.

Contents:
- A laboratory study of horizontal dipoles--TEMPS;
- Capacitor development and testing;
- Prototype marx generator switch evaluation;
- Switch acceptance testing;
- Solid resistor development;
- Solid-dielectric gas-graded peaking capacitor;
- Single-module peaking capacitor tests.

AD-A013 645/7GA PC$3.75/MF$2.25
American Nucleonics Corp Woodland Hills Calif
Handbook of Operating and Maintenance Instructions for Earth Parameter Measurement Test Set (EPMTS).
Jan 73, 28p
Contracts DAAG39-73-C-0084, DAAK02-71-C-0418

Descriptors: *Test sets, Earth(Planet), Measurement, Dielectric properties, Electrical conductivity, Instruction manuals.
Identifiers: Soil properties.

The Earth Parameter Measurement Test Set (EPMTS) is a system for measuring the dielectric constant and conductivity of the earth by measuring the effect of these parameters on a parallel wire transmission line placed close to the earth. The system automatically measures the resonant frequency where the length of the line is wavelength/4, and the input impedance of the probe and by suitable calibration charts, the conductivity and dielectric constant may be measured.

AD-A013 678/8GA PC$3.75/MF$2.25
George Washington Univ Washington D C Inst for Management Science and Engineering

Inference from Accelerated Life Tests Using the Inverse Power Law Model.
Scientific rept.,
Nozer D. Singpurwalla, and Faiz A. Al-Khayyal.
30 Jun 75, 31p Rept no. Serial-T-318
Contracts N00014-75-C-0729, F33615-74-C-4040

Descriptors: *Reliability, *Weibull distribution functions, *Accelerated testing, *Life expectancy, *Parametric analysis, Estimates, Least squares method, Optimization, Materials, Test methods, Failure, Scaling factors, Data acquisition.
Identifiers: Inverse power law model, *Power law model, *Maximum likelihood estimation, SUMT(Sequential unconstrained minimization technique), Sequential unconstrained minimization technique, Inference, Relative likelihood function, Shape parameter.

Parameters of the Power Rule Model, and the shape parameter of the Weibull distribution are estimated using data from censored sample life tests conducted at accelerated environments. Two approaches to the maximum likelihood method are considered; one is based on the observed time to failure and the other is based on the maximum likelihood estimators of the Weibull scale and shape parameters. The behavior of the likelihood function for the latter approach is examined in good detail. The asymptotic normality of these estimators is ascertained by examining the shapes of the relative likelihood functions. Inference about the Weibull scale parameter at use conditions environment is discussed. A numerical example based on accelerated life test data is presented and discussed. (Author)

AD-A013 772/9GA PC$3.25/MF$2.25
Air Force Weapons Lab Kirtland AFB N Mex
Investigation of Solidification of Nitrous Oxide under Flow Conditions.
Final rept. 30 Jun-30 Aug 74,
Melvin Eisenstadt, and James Cawthra. Jul 75, 21p Rept no. AFWL-TR-74-265

Descriptors: *Nitrogen oxides, *Solidification, Airborne, Gas lasers, Gas flow, Emergencies, Venting.
Identifiers: Airborne Laser Laboratory, ALL(Airborne Laser Laboratory), Nitrogen oxide(N2O).

Under emergency conditions, it may be necessary to land the Airborne Laser Laboratory (ALL) aircraft with the propellant tanks empty. For this reason, the design provides for dumping liquid propellants and venting gaseous propellants to the atmosphere. Indications were that dumping and venting the N2O tank might be problematic. Two actual incidents generated concern regarding possible solidification of the N2O in the dump and/or vent lines if the tank were emptied during flight. It was felt that if solidification took place in the lines, the lines might be blocked and the N2O tank could not be emptied. The report describes both the theoretical and experimental work done in order to evaluate the problem. The theoretical analysis aided greatly in understanding what was happening and why, but it was incapable of assessing whether or not an operational problem existed during dumping of the N2O. This question was finally settled by a test program, and it was found that dumping and venting N2O presented no operational problems.

AD-A013 774/5GA PC$3.25/MF$2.25
Air Force Weapons Lab Kirtland AFB N Mex
Analysis of a Helium Pressurant Loading System for a Fluid Supply System (FSS).
Final rept. 1 Jan-31 Jul 74,
Dean A. Schneider. Jun 75, 18p Rept no. AFWL-TR-74-270

Descriptors: *Gas dynamic lasers, *Pressurization, Tanks(Containers), Mathematical models, Fluid flow, Thermodynamics, Cryogenics.

A gas dynamic laser is a combustor-driven device that requires propellants for operation. The propellants are supplied to the combustor by the fluid supply system (FSS)5 This report describes a model for the analysis of a fluid supply system loading system to determine the pressure-, temperature-, and mass-time history of the helium pressurant during loading. The equations developed were coded into a computer program. Sample results are given.

AD-A013 783/6GA PC$7.00/MF$2.25
Pulsar Associates Inc La Jolla Calif
High Voltage Pulser Techniques for Electromagnetic Pulse (EMP) Simulators.
Final rept. Sep 72-Jun 74,
J. Steven Granados, John T. Naff, Walter F. J. Crewson, and Carleton H. Jones, Jr. Jul 75, 179p AFWL-TR-74-142
Contract F29601-71-C-0121

Descriptors: *Electromagnetic pulse simulators, Pulse generators, High voltage, Electric switches.

This report presents the results of both theoretical and practical investigations aimed at improving the performance of a number of key components that are common to many EMP high voltage generators. The advantages of component redundancy over attempting to achieve extreme individual component reliability are outlined. Common capacitor faults are discussed together with methods of their detection and techniques for circumventing a failed capacitor in a Marx generator. Marx switch faults and timing irregularies are also discussed. A specific design for a high voltage fuse for use in Marx generator circuits which was developed and tested is presented. A cascade high voltage ropeswitch is discussed.

AD-A013 790/1GA PC$3.25/MF$2.25
Tri-Con Associates Inc Cambridge Mass
The Design Development and Test of Satellite and Balloon Borne Mass Spectrometers.
Interim rept.,
George P. Murphy. Aug 74, 25p Rept no. Scientific-1 AFCRL-TR-75-0183
Contract F19628-73-C-0192

Descriptors: *Mass spectrometers, *Atmospheric sounding, Electronic equipment, Schematic diagrams.
Identifiers: Design, *Quadrupole mass spectroscopy.

The report covers the work done in development of electronic instrumentation which will be used on satellite and balloon flights to measure ion species in the ionosphere and stratosphere. The satellite instrument is designed to measure both neutral and positive ion constitutents from 1 AMU to 44 AMU. The balloon instrument is designed to measure positive ions in the range of 10 AMU to 400 AMU.

AD-A013 804/0GA PC$3.75/MF$2.25
Oceanics Inc Plainview N Y
Experimental Verification That at Mach One Wind Tunnel Wall Interference Decreases With Model Thickness.
Interim rept.,
Theodore R. Goodman, and August F. Lehman. Jun 75, 35p Rept no. 75-117 AFOSR-TR-75-1174
Contract F44620-72-C-0079

Descriptors: *Hydraulic models, *Wind tunnels, *Transonic characteristics, *Walls, Porosity, Interference, Comparison, Model tests, Analog systems, Water channel test facilities, Hypotheses, Thickness, Thinness, Pressure measurement, Test methods, Variations.
Identifiers: *Wall interference, Similarity.

In an earlier analytical investigation it had been hypothesized that at Mach one thick models experience less wind tunnel wall interference than thin ones. This experimental study, performed with a water table having adjustable porosity sidewalls, utilizes the hydraulic analogy to verify the hypothesis. The pressure distribution on three affinely similar models, each having the same chord but with different thicknesses, was measured at several different settings of wall porosity. The hypothesis was verified in two ways: First, by comparing the pressure coefficient distribution for the three models at different wall porosities, second, by comparing the fluctuation of the normalized pressure coefficient for wall porosity at many chordwise stations.

AD-A013 814/9GA PC$4.25/MF$2.25
General Dynamics San Diego Calif Convair Aerospace Div
A Study of Expected Data Precision in the Proposed AEDC HIRT Facility.
Final rept. Apr 73-31 Jan 74,
J. R. Picklesimer, W. H. Lowe, and D. P. Cumming. Aug 75, 64p Rept no. CASD-AFS-73-008 AEDC-TR-75-61
Contract F40600-72-C-0015
See also report dated Mar 73, AD-763 725 and report dated Jul 75, AD-A013 815.

Descriptors: *Transonic wind tunnels, Data acquisition, Flow fields, Stagnation pressure, Dynamic pressure, Aerodynamic characteristics, Aerodynamic configurations.

AEDC has proposed an 8 x 10 foot Transonic Wind Tunnel (HIRT) operating on a Ludwieg tube concept. This facility is designed to meet the need to properly simulate the full-scale Reynolds numbers of current and future aircraft. HIRT differs from conventional wind tunnels in the characteristics of short run duration, high operating pressures, low temperatures and high aerodynamic loads. The purpose of this study was to assess the precision of the test data expected from HIRT and to examine HIRT to determine if its mode of operation would adversely affect data precision. It was assumed that the precision of the drag measurement could be used as the yardstick for evaluating over-all precision of facility test data. To establish a baseline from which the predicted precision of model gleaned in HIRT could be compared, a transonic tunnel data accuracy questionnaire was completed by five leading domestic transonic facilities. The responses to this questionnaire are summarized in this report.

AD-A013 815/8GA PC$3.75/MF$2.25
General Dynamics San Diego Calif Convair Aerospace Div
Study of Six-Component Internal Strain Gage Balances for Use in the HIRT Facility.
Final rept. Apr 73-Feb 74 on Phase 2,
M. L. Kuszewski, P. J. Mole, and S. A. Griffin. Jul 75, 41p Rept no. CASD-AFS-73-009 AEDC-TR-75-63
Contract F40600-72-C-0015
See also report dated Aug 75, AD-A013 814 and report dated Mar 73, AD-763 725.

Descriptors: *Transonic wind tunnels, *Strain gages, Balances, Maraging steels, Loads(Forces), Fatigue life, Stress analysis.
Identifiers: *Strain gage balances, Steel 18-Ni.

The need for a High Reynolds Number Transonic Wind Tunnel (HIRT) has been recognized throughout the industry for some years. The proposed HIRT facility at Arnold Engineering Development Center will provide a much needed tool for the study of phenomena sensi-

tive to Reynolds number. The usefulness of the HIRT facility will be largely influenced by the ability of industry to design and build wind-tunnel models and internal strain gage balances capable of operating within the severe environment of the tunnel. The balance concept selected for this study has been used for the past ten years at General Dynamics and is known as a two-shell balance. Information presented is based on experience together with the results of experimental work in progress at General Dynamics.

AD-A013 852/9GA PC$4.25/MF$2.25
Tetra Tech Inc Pasadena Calif
Matching a Particular Pulser to a Parallel-Plate Simulator.
Final rept. 10 Jul-18 Oct 74,
R. W. Latham, M. I. Sancer, and A. D. Varvatsis.
Jul 75, 63p AFWL-TR-74-287
Contract F29601-74-C-0115

Descriptors: *Electromagnetic pulse simulators, Pulse generators, Capacitors, Matching.
Identifiers: Marx generators.

As electromagnetic energy source that incorporates the peaking capacitor arms of a Marx generator as part of its electromagnetic configuration is to be used in an Electromagnetic Pulse simulator to be build under the supervision of the Air Force Weapons Laboratory. In this report, the positions of the peaking capacitors that fulfill certain desirable null-flux conditions are determined. The characteristic impedance and several other useful properties of the conical base of the pulser are also calculated.

AD-A013 881/8GA PC$4.75/MF$2.25
Adaptronics Inc Mclean Va
Adaptive Nonlinear Signal Processing for Characterization of Ultrasonic NDE Waveforms. Task 1: Inference of Flatbottom Hole Size.
Interim technical rept. 1 May 74-31 Jan 75,
Anthony N. Mucciardi, Ramesh Shankar, John Cleveland, William E. Lawrie, and Henrie L. Reeves. Feb 75, 93p Rept no. 687 AFML-TR-75-24
Contract F33615-74-C-5122

Descriptors: *Nondestructive testing, *Signal processing, *Ultrasonic tests, Adaptive systems, Pattern recognition, Defects(Materials), Echoes, Power spectra, Nonlinear systems, Holes(Openings).

The overall objective of this first work task was to demonstrate feasibility of adaptive nonlinear signal processing techniques, from cybernetics and bionics, applied to characterization of ultrasonic nondestructive testing (UNDT) waveforms for accurate inferences of flat-bottom hole sizes. The classified waveforms were ultrasonic pulse echoes obtained from 2 different sets of 7075-T6 aluminum test blocks and 3 different transducers. The eight flat-bottom hole defect sizes ranged from 1/64 to 8/64 inch in steps of 1/64 inch.

AERE-R-7946 PC$4.25/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Review of Current Ultrasonic Nondestructive Testing Developments in the United Kingdom.
G. J. Curtis. Feb 75, 25p
U.S. Sales Only.

Descriptors: (*Ultrasonic testing, *Reviews), Research programs, Transducers, United kingdom.

For abstract, see NSA 32 03, number 06354.

COM-75-11069/2GA PC$3.75/MF$2.25
National Bureau of Standards, Washington, D.C. Vibration Section.
Piezoelectric Accelerometer Low-Frequency Response by Signal Insertion Methods.
Final rept.,
Robert S. Koyanagi, and James D. Pollard. May 75, 34p NBSIR-74-597
Contract CCG-74-93
Sponsored in part by Bureau of Naval Weapons Representative, Pomona, Calif. Metrology Engineering Center, and Aerospace Guidance and Metrology Center, Newark Air Force Station, Ohio.

Descriptors: *Accelerometers, Piezoelectric crystals, Frequency response, Sensitivity, Calibrating, Tests.

The purpose of this study was to compare the frequency response of selected piezoelectric accelerometers using a signal insertion method to the response using traditional mechanical vibration tests. Signal insertion methods included 'voltage insertion' and charge insertion techniques. The signal is inserted in series with the electrical low-side of the accelerometer by means of a suitable series resistance. Commercially available insertion devices were used. Confidence in the use of insertion methods is increased where there is agreement between the results from insertion tests and mechanically excited tests.

COM-75-11111/2GA PC$3.75/MF$2.25
National Bureau of Standards, Washington, D.C. Heat Div.
Optical Radiation Measurements: The NBS 20-, 60-, and 85- Degree Specular Gloss Scales.
Final rept.,
Jack J. Hsia. Jul 75, 35p NBS-TN-594-10

Descriptors: *Spectrophotometry, *Colorimetry, Gloss, Specular reflection, Accuracy, Error analysis, Light scattering, Radiance, Transmittance, Numerical analysis.

The 20-, 60-, and 85- degree specular gloss scales are established at NBS with an accuracy of about one half gloss unit. This is one of many programs of the spectrophotometry group of the Optical Radiation Section of NBS directed toward improving the accuracy and assurance of spectrophotometric measurements made throughout the scientific and industrial community. The specular gloss scales are established through a unique technique employing polarized light flux both parallel and perpendicular to the plane of incidence. General calibration equations are derived. NBS instrumentation and measurement procedures are described. Instrument calibration and error analyses are performed. Some of the analyses can also be applied to reflectance measurements in general.

COM-75-50469/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Procedures for Gage Block Flatness and Parallelism Measurement.
Final rept.,
J. S. Beers, and C. D. Tucker. 1974, 3p
Pub. in Jnl. of Appl. Meas., v2 n4 p82-84 1974.

Descriptors: *Measuring instruments, Standards, Measurement.
Identifiers: Reprints, *Gage blocks.

Geometric properties of gage blocks are important in many length measurement applications. Methods are described for measuring the flatness of gaging faces and the parallelism between opposing gaging faces. These methods, used for many years, employ interferometers and electro-mechanical gage block comparators.

GEPP-136 PC$4.00/MF$2.25
General Electric Co., St. Petersburg, Fla. Neutron Devices Dept.
Computer Control of Partial Pressure Analyzer.
T. A. Wedel. Apr 75, 10p
Contract AT(29-2)-656

Descriptors: (*Vacuum gages, *Control systems), Computers, Data processing, Equipment interfaces, Ultrahigh vacuum.

For abstract, see NSA 32 03, number 06371.

JINR-P13-8705 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Sensitive Shapers on Integral Schemes.
V. F. Boreiko, V. M. Grebenyuk, and V. G. Zinov. 1975, 10p
In Russian. U.S. Sales Only.

Descriptors: (*Pulse shapers, *Design), Electronic circuits, Pulse rise time, Sensitivity.

For abstract, see NSA 32 03, number 06581.

MLM-2222(OP) PC$4.00/MF$2.25
Mound Lab., Miamisburg, Ohio.
Computerized Automated Pressure/Volume Calibration System.
R. L. Shaffer, and D. A. Homan. 18 Apr 75, 38p
CONF-750457-1
Contract AT-33-1-GEN-53

Descriptors: (*Gas cylinders, *Pressure gages), (*Volume, *Measuring instruments), Automation, Calibration, Computers, Design.

For abstract, see NSA 32 03, number 06582.

NTIS/PS-75/662/7GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Hot Wire Anemometery. Volume 1. 1964-1970 (A Bibliography with Abstracts).
Rept. for 1964-1970,
Gerald H. Adams. Aug 75, 76p*
See also Volume 2, NTIS/PS-75/663.

Descriptors: *Bibliographies, *Hot wire anemometers, Instruments, Design, Calibration, Wind tunnel tests, Flow fields, Mathematical models, Theories, Heat transfer, Boundary layer flow, Aerodynamic configurations, Turbulent flow, Laminar flow, Computer programming, Acoustic fields.
Identifiers: Hot wire anemometry.

Experiments, instrumentation, and measurements are reported in this bibliography in the field of hot wire anemometry. Citations include work in boundary layer investigations, instrument characteristics and calibration, acoustic fields, wind tunnel tests, algorithms, gas flow, heat transfer, supersonic flow, resonant frequencies, harmonic analysis, theory, flow about geometric shapes, nozzle and jet flow, mathematical models, turbulence, nucleate boiling, measurements under water, pipe flow, computer applications, feedback, shear flow, airfoil characteristics, cavitation, unsteady flow, and related subjects. (Contains 71 abstracts)

NTIS/PS-75/663/5GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Hot Wire Anemometery. Volume 2. 1971-July 1975 (A Bibliography with Abstracts).
Rept. for 1971-Jul 75,
Gerald H. Adams. Aug 75, 92p*
See also Volume 1, NTIS/PS-75/662.

Descriptors: *Bibliographies, *Hot wire anemometers, Theoretical studies, Calibration,

Circuits, Fluid dynamics, Boundary layer flow, Hypersonic characteristics, Supersonic characteristics, Transonic characteristics, Subsonic characteristics, Mathematical models, Geometric forms, Wind tunnel models, Turbulence, Simulation.
Identifiers: Hot wire anemometry.

Volume 2 of a two part bibliography continues the abstracts on hot wire anemometry and hot wire anemometers. Citations include principles; calibrating; circuit diagrams; flow measurement; hypersonic, supersonic, transonic, and subsonic characteristics; boundary layer studies; turbulence; jet, pipe, and tunnel flow; mathematical models; wind tunnel model tests; airport structure simulation; mass transfer and flow stability; probe modifications; flow about geometric forms; flow patterns; and related topics. (Contains 87 abstracts)

NTIS/PS-75/664/3GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Hot Film Anemometry (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Gerald H. Adams. Aug 75, 37p*

Descriptors: *Bibliographies, *Anemometers, Films, Fluid dynamics, Theoretical studies, Design, Wind tunnel models, Boundary layer flow, Turbulent flow, Laminar flow, Mathematical models, Aerodynamic configurations.
Identifiers: *Hot film anemometers, Flow fields.

The principles of hot film anemometer operation are summarized; wind tunnel and laboratory tests are described; flow field dynamics are discussed involving turbulence, boundary layers, separation, shock waves, and stresses; mathematical models and analysis are presented; computer techniques are outlined; and a number of applications are given. (Contains 32 abstracts)

NTIS/PS-75/666/8GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Nondestructive Testing: X-ray Photography and X-ray Radiography (A Bibliography with Abstracts).
Rept. for 1964-Jun 75,
William E. Reed. Aug 75, 130p*

Descriptors: *Bibliographies, *Nondestructive tests, *Radiography, X ray inspection, X ray apparatus, Defects, Fatigue(Materials), Physical properties.
Identifiers: *X ray photography.

Federally-sponsored research and foreign reports covering techniques, equipment, and applications are cited. Applications include flaw detection, fatigue cracking, inspection of joints, and measurements of mechanical and physical properties. (Contains 125 abstracts)

NTIS/PS-75/667/6GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Standard Reference Materials (A Bibliography with Abstracts).
Rept. for 1964-Jul 75,
George W. Reimherr. Aug 75, 146p*
Supersedes NTIS/PS-75/041.

Descriptors: *Chemical analysis, *Bibliographies, Alloys, Radioactive isotopes, Flue gases, Thermocouples, Chemical elements, Chemical compounds, Standards, Polymers, Temperature measurement, Electrical resistivity, Thermal conductivity, Spectrophotometry, Spectroscopic analysis, Calorimetry.
Identifiers: *Standard reference materials, Air pollution detection, Clinical chemistry.

The cited reports present research concerning standard reference materials for science and technology. Fields covered include chemistry, physics, pollution detection, and metallurgy. All the references originated from the National Bureau of Standards, however, all NBS research on reference materials and standard methods are not covered. (Contains 141 abstracts)

N75-26208/9GA PC$4.75/MF$2.25
Forschungsinstitut fuer Funk und Mathematik, Werthoven (West Germany).
Proposal for an Automatic Supervision of Electronically Controlled Radar Antennas Vorschlag Zur Automatischen Ueberwachung von Elektronisch Steuerbaren Radarantennen.
G. Hueschelrath. Nov 73, 76p REPT-209
In German; English Summary.

Descriptors: *Automatic test equipment, *Electronic control, *Phased arrays, *Radar antennas, Block diagrams, Computer programs, Computerized simulation, Equalizers (Circuits), Phase error, System failures.

For abstract, STAR 1317

N75-26318/6GA PC$3.75/MF$2.25
Oxford Univ. (England). Dept. of Engineering Science.
The Water Cavitation Tunnel: Description and Operating Procedures.
A. B. Bailey. 1974, 36p OUEL-1083/74

Descriptors: *Cavitation flow, *Hydraulic test tunnels, *Water flow, Control equipment, Equipment specifications, Maintenance, Measuring instruments, Pumps.

For abstract, STAR 1317

N75-26338/4GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Investigation of Facsimile Camera-Spectrometer Capability in the 1.0 to 2.7 Micron Spectral Range.
W. L. Kelly, Iv. Jun 75, 20p NASA-TM-X-72714

Descriptors: *Computer techniques, *Multispectral band cameras, *Spectrometers, *Viking lander spacecraft, Absorption spectra, Chemical composition, Mars (Planet), Mathematical models, Moisture content, Signal to noise ratios, Spectral resolution.

For abstract, STAR 1317

N75-26559/5GA PC$3.25/MF$2.25
Weapons Research Establishment, Salisbury (Australia).
The Effect of the Earth'S Atmosphere on Baseline Determinations by Very Long Baseline Interferometry.
K. J. W. Lynn, and J. S. Gubbay. Jan 75, 22p
WRE-TN-1312(WR/D)

Descriptors: *Earth atmosphere, *Frequency measurement, *Frequency shift, *Interferometers, *Radio frequencies, Atmospheric models, Doppler effect, Extraterrestrial radio waves, Ionosphere, Mathematical models, Refractivity.

For abstract, STAR 1317

N75-26561/1GA PC$3.75/MF$2.25
Ludwig-Maximilians-Universitat, Munich (West Germany). Abteilung fuer Atmosphaerische Strahlung und Satellitenmeteorologie.
Aircraft and Balloon Borne Spectral Radiometers Spektralradiometer fuer Flugzeug- und Ballooneinsatz.
Final Report.
K. T. Kriebel, F. Koepp, H. J. Bolle, and V. Mann. Dec 74, 29p BMFT-FB-W-74-11
Contract WRK-174
In German; English Summary.

Descriptors: *Airborne equipment, *Balloonborne instruments, *Spectroradiometers, Balloon sounding, Clouds (Meteorology), Earth albedo, Horizon scanners, Reflected waves.

For abstract, STAR 1317

PAT-APPL-502 265/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Vibrating Wire Stress Meter and Method to Clamp Wires.
Patent Application,
Ivor (NMI) Hawkes. Filed 3 Sep 74, 13p
DOCKET/MIN-2186
Also available as report no. DOCKET/MIN-2187.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Determination of stress, *Measuring instruments, *Patent applications, Wire, Vibration, Clamps.

The patent application describes a vibrating wire stress meter and the method used to clamp its wire in position. The wire is highly tensioned diametrically across the sides of a hollow metallic cylinder and held there by two anchor tubes. A wedge and platen assembly in turn hold this cylinder in a rock borehole such that small stress changes in the surrounding rock cause the diameter of the cylinder to slightly change. This cylinder variation is transmitted to and measured by the preloaded wire by noting variations in its frequency or period of vibration. To cause the wire to vibrate a coil, magnet, and yoke are used as a plural pole electromagnetic plucker. Clamping of the wire is accomplished by highly tensioning the wire between two opposite hollow tubes that are seated in opposite aligned countersunk holes of the cylinder and then extruding the steel tubes around the wire.

PAT-APPL-507 099/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Bed Level Monitor.
Patent Application,
Walter (NMI) Fuchs. Filed 18 Sep 74, 12p
DOCKET/MIN-2302
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Liquid level indicators, *Patent applications, Reflectometers, Time measurement, Beds(Process engineering).
Identifiers: Time domain reflectometry, Time domain.

The patent application describes a method and an apparatus for determining the level of fluid in a vessel having a delay line formed in the vessel responsive to pulses derived from a source. In response to pulses from the source reaching the level of the material in the vessel, the pulse is reflected due to the change in characteristic impedance of the delay line. The propagation time of the pulse is a measure of the level of the fluid.

PAT-APPL-585 420/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
Static Coefficient Test Method and Apparatus.
Patent Application.
C. L. Haehner, and J. L. Tarpley. Filed 9 Jun 75, 18p NASA-CASE-GSC-11893-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Coefficient of friction, *Friction measurement, *Static friction, Compression loads, *Patent applications, Sliding friction.

A method and apparatus is described for determining the static coefficient of friction between contacting surfaces of a plurality of bodies. A flexible filament fixedly connected to one of the bodies is alternately and cyclically tensioned and relaxed in response to another of the bodies being moved at constant velocity relative to a fixed portion of the filament. Coefficients of friction for contacting surfaces under high compressive loads up to 600 psi are determined by utilizing a test fixture including a calibrated compression spring that exerts a normal force on the contacting surfaces.

PAT-APPL-590 183/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Simulator for Practicing the Mating of an Observer-Controlled Object with a Target.
Patent Application.
W. J. Polstorff. Filed 25 Jun 75, 23p NASA-CASE-MFS-23052-1
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Replicas, *Servocontrol, *Simulators, *Space exploration, *Targets, Computers, *Patent applications, Television cameras, Windows (Apertures).

A description is given of a simulator by which an observer, viewing both a target and an object under his control, can practice mating the object with the target. The target replica is coded along one coordinate axis in such a way that the distance of an elemental area on the target along the axis is capable of being remotely readout by a television camera. The code is by way of a variation in color, in brightness or a combination of color or brightness. A third television camera responsive to the code provides information by which a target range signal is generated for each picture element of the scene televised by the target camera. The computer calculates an object range signal for each picture element of the scene televised by the object camera, and a comparator compares range signals for corresponding picture elements of both scenes in order to determine which camera is to be blanked from the monitor in order to create the illusion that one or the other of the target and the object is closer to the observer.

PATENT-3 164 023 Not available NTIS
Department of the Army Washington D C
Motion Sensing Transducer.
Patent,
Oscar C. Holderer. Filed 10 Sep 62, patented 5 Jan 65, 3p Rept nos. PAT-APPL-222 747,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. $0.50.

Descriptors: *Transducers, *Patents, Signal processing, Hemispherical shells, Capacitors, Electrical measurement.
Identifiers: PAT-CL-73-516.

This invention relates generally to a transducer and specifically to a transducer which provides means for detecting and recording inclinations and accelerations. A sealed vessel contains a displaceable mass and a fluid having an electrical resistance different from that of the displaceable mass. The vessel has mounted therein a plurality of electrodes arranged so that a deviation in the position or movement of the device creates an unbalanced condition in an electrical circuit.

PATENT-3 164 983 Not available NTIS
Department of the Army Washington D C
Horizontal Displacement Meter.
Patent,
Beauregard Perkins, Jr., and Willis F. Jackson. Filed 30 Nov 60, patented 12 Jan 65, 3p Rept nos. PAT-APPL-72 812,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Explosion effects, *Gages, *Patents, Soils, Displacement, Inertial systems, Explosions.
Identifiers: PAT-CL-73-71.

This invention relates to a device to determine the absolute transient motion of the ground particle from an explosion above or below the surface of the ground or by the impact of a large mass on the surface of the ground.

PATENT-3 183 438 Not available NTIS
Department of the Army Washington D C
Modulated Power Measuring Bridge with Automatic A.C. and D.C. Rebalancing.
Patent,
Max M. Hirsch. Filed 8 Mar 60, patented 11 May 65, 13p Rept nos. PAT-APPL-13 480,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electric bridges, *Patents, Power measurement, Radiofrequency power, Electromagnetic radiation.
Identifiers: PAT-CL-324-106.

The patent relates, in general, to a method for reasuring power of alternating currents, radio waves, microwaves and from radiant sources of various types. Measurement can occur over a great range of frequencies of electromagnetic energy from below a kilocycle per second to above the ultraviolet. This method employs the principle of the thermal equivalence of different kinds of energy with accuracy and extreme sensitivity over a great dynamic range. The invention also relates to apparatus for practicing the method of the present invention.

PATENT-3 740 740 Not available NTIS
Department of the Army Washington D C
Liquid Cryogen Detector.
Patent,
William C. Milo. Filed 12 Jan 72, patented 19 Jun 73, 3p Rept nos. PAT-APPL-217 179,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Temperature measuring instruments, *Patents, Temperature sensitive elements, Carbon resistors, Cryogenics, Detectors.
Identifiers: PAT-CL-340-244-R.

The patent describes a carbon composition resistor sensor that is lowered to a cryogen material which is in its cryogenic state. The current through the sensor is maintained constant by a regulator, and when a substantial change in the resistance of the carbon sensor occurs, an amplifier having its input connected across the regulator senses the change in the resistance of the regulator and causes a light to go on or off so as to indicate the top level of the cryogenic material.

PATENT-3 744 303 Not available NTIS
Department of the Army Washington D C
Pure Fluidic Strain Gage.
Patent,
Tadeusz M. Drzewiecki, and Francis M. Manion. Filed 23 Nov 71, patented 10 Jul 73, 5p Rept nos. PAT-APPL-201 482,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Strain gages, *Patents, Fluidic control, Fluid amplifiers, Ducts, Deformation.
Identifiers: PAT-CL-73-88-R.

In the patent a pure fluidic strain gage is disclosed which comprises a conduit or duct constructed of deformable material through which a fluid is caused to flow. The conduit is adapted to receive an external stress and be deformed thereby in a predetermined manner such as by a change in length or the like of the conduit. This deformation produces a change in fluid resistance in the channel and thus effects a variation in the flow characteristics of the fluid through the conduit. A monitoring device, such as a fluidic proportional amplifier, is provided to detect such variations in flow characteristics, these variations being indicative of the value of the external stress received by the conduit and the strain of the conduit.

PATENT-3 745 051 Not available NTIS
Department of the Army Washington D C
Quadruple Lap Simple Shear Test Specimen.
Patent,
Judson R. Griffin, Donald L. Martin, Jr., and Robert E. Siron. Filed 9 Nov 71, patented 10 Jul 73, 2p Rept nos. PAT-APPL-197 000,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Test methods, *Patents, *Shear properties.
Identifiers: *Test specimens, PAT-CL-161-44.

The patent describes a simple shear test specimen having two aligned load plates. A piece of material to be tested is bonded to each of the outer surfaces of each load plate and two side plates, one bonded to the outer surface of one of the pieces of material to be tested on each load plate and the other bonded to the other two pieces of material to be tested.

PATENT-3 745 832 Not available NTIS
Department of the Army Washington D C
Link-Type Hypersonic Centrifuge.
Patent,
Allen M. L. Johnson. Filed 13 May 71, patented 17 Jul 73, 10p Rept nos. PAT-APPL-143 073,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Centrifuges, *Patents, Guided missile components, Test methods, Centrifugal force, Rotation.
Identifiers: PAT-CL-73-432-R.

In the invention a centrifuge is disclosed for subjecting items under test forces similar to those encountered in ballistic flight. The centrifuge includes a controlled crank arm which alters the radial position of the sample under test while the centrifuge is rotating to therefore increase or decrease the forces thereon. Details of the crank arm mechanism and counterweight and balance systems are also disclosed.

PATENT-3 826 128 Not available NTIS
Department of the Interior, Washington, D.C.
Surface Deformation Indicating Apparatus.
Patent,
James R. McVey, and Thomas O. Meyer. Filed 1 Feb 73, patented 30 Jul 74, 7p PAT-APPL-328 822,
Also available as report no. DOCKET/MIN-1911.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Deformeters, *Patents, Surfaces, Plates, Pressure, Remote sensing, Telemetry, Mines(Excavations).
Identifiers: PAT-CL-73-88-E.

The patent describes an apparatus to indicate deformation of a surface such as the interior of a mine, to which it is attached.

PATENT-3 867 627
Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Fast Data Acquisition System.
Patent,
Melvin A. Nelson, Terence J. Davies, and John C. Clark. Filed 8 Jan 74, patented 18 Feb 75, 7p PAT-APPL-431 809
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Data acquisition, *Patents, Transients, Electrooptics, Kerr cells, Pulse analyzers.
Identifiers: PAT-CL-250-199.

The patent describes a data acquisition system for obtaining detailed information on fast, transient electrical signals. The signal to be recorded is applied as a traveling wave to a longitudinally extending electro-optical modulator. Light pulses are applied to a plurality of locations along one side of the modulator and modulated pulses representative of the intensity of the electrical signal at those locations received on the opposite side and further processed such as by conversion to digital.

PATENT-3 867 688
Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Electrodeless Conductance Measurement Device.
Patent,
Oscar H. Koski. Filed 18 Dec 73, patented 18 Feb 75, 4p PAT-APPL-425 919
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Electric measuring instruments, *Patents, Electrical resistance.
Identifiers: PAT-CL-324-30-A.

The patent describes a device provided for electrodeless measurement of the conductance of a material. A damped oscillatory signal is applied to the primary winding of a first transformer ring core. A current loop, including as part of its path the material and carrying a current in response to a signal of the primary winding, couples the first core to a second transformer ring core by acting as a secondary winding for the first core and as a primary winding for the second core. The peak current in a secondary winding of the second core due to and corresponding to the current in the loop and the peak voltage across the loop, which is constant for all materials at the instant the damped oscillatory signal is applied to the primary winding, gives the conductance of the loop.

PATENT-3 872 718
Not available NTIS
Energy Research and Development Administration, Washington, D.C.
Multipurpose Sampler Device for Liquid Metal.
Patent,
Paul A. Nelson, Verne M. Kolba, and John T. Holmes. Filed 30 Oct 73, patented 25 Mar 75, 9p PAT-APPL-411 129
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Samplers, *Patents, Liquid metals, Liquid metal cooled reactors.
Identifiers: PAT-CL-73-86.

The patent describes a device for collecting samples or examining a flow of liquid metal for use with such as a liquid-metal-cooled nuclear reactor. The sampler device includes a casing surrounded by an external heater for establishing an upper isothermal zone and a lower zone for heating the entering liquid metal. One of various inserts is suspended into the isothermal zone where it is surrounded by a shroud tube for directing liquid-metal flow from the heating zone into the top of the insert. Discharge flow from the insert gravitates through a helically wound tube in heat exchange contact with entering liquid-metal flow within the heating zone. The inserts comprise an overflow cup with upper and lower freeze seals, a filter for removing particulate matter, and a fixture for maintaining various sample materials in equilibrium with liquid-metal flow.

PATENT-3 887 345
Not available NTIS
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Gas Chromatograph Injection System.
Patent.
G. E. Pollock, M. E. Henderson, and R. W. Donaldson, Jr.. Filed 3 Jun 75, 7p PAT-APPL-446 564
Misc-Filed 27 Feb. 1974 Supersedes N74-20021 (12-11, p 1290).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Chemical analysis, *Gas chromatography, *Gas injection, Equipment specifications, Gas analysis, *Patents, Vaporizing.
Identifiers: PAT-CL-55-386.

An injection system for a gas chromatograph is described which uses a small injector chamber (available in various configurations). The sample is placed in the chamber while the chamber is not under pressure and is not heated, and there is no chance of leakage caused by either pressure or heat. It is injected into the apparatus by changing the position of a valve and heating the chamber, and is volatilized and swept by a carrier gas into the analysis apparatus.

PATENT-3 887 804
Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
Radiographic Test Stand.
Patent,
Tommie J. Morgan, George I. Coats, Richard W. Kisielewski, and Charles K. Showalter. Filed 3 Dec 73, patented 3 Jun 75, 10p* PAT-APPL-420 977,
Supersedes PB-232 469.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *X ray apparatus, *Alignment, *Patents, Radiography.
Identifiers: PAT-CL-250-252.

The patent describes a test stand for maintaining fixed geometry during X-ray imaging. The stand consists of a slide aperture for beam definition, a slide assembly having a wire grid for image sizing; and magnetic tape which secures metal strips for marking the edge of the light field relative to an X-ray field during imaging. The image is recorded on Linographic paper carried by the slide assembly.

PATENT-3 888 410
Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Fluid Control Apparatus and Method.
Patent.
C. W. Mckee. Patented 10 Jun 75, 5p PAT-APPL-420 424
Misc-Filed 30 Nov. 1973 Supersedes N74-29652 (12-19, p 2268).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Centrifuges, *Fluid filters, *Gas-liquid interactions, *Separators, *Weightlessness, Equipment specifications, *Patents, Product development.
Identifiers: PAT-CL-233-6.

A container for controlling and separating fluids and gases without using seals between movable parts is disclosed. The method works by placing the container in orbit about a circular path and holding it at a fixed orientation; the orientation coupled with the orbiting, cause the liquids and gases present to separate even when in a zero gravity environment. Flexible conduits provide for flow of liquids or gases to and from the interior of the container.

PATENT-3 889 182
Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Resonant Waveguide Stark Cell.
Patent.
W. C. Easley, W. F. White, and G. A. Wingfield. Patented 10 Jun 75, 4p PAT-APPL-459 736
Misc-Filed 10 Apr. 1974 Supersedes N74-19854 (12 - 11, p 1269).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Microwave equipment, *Spectrometers, *Stark effect, *Waveguides, Microwave spectra, *Patents, Reflection, Resonance.
Identifiers: PAT-CL-324-58-5.

A resonant waveguide Stark cell suitable for use in a Stark-modulated microwave spectrometer was developed. The cell is constructed from a short guide of waveguide. A Stark electrode is located inside the wavelength parallel to the broad face of the guide and insulated from the walls of the guide with narrow teflon strips. A reflector with a small coupling iris at its center is located at one end of the cell. This small coupling iris is for passing microwave energy into and out of the cell. At the other end of the cell there is an adjustable waveguide short making the small Stark cell into a tuneable cavity which can be tuned for resonance at selected microwave frequencies. Means are provided for maintaining a gas-tight compartment within the cell, and ports are provided for the introduction of the gas to be analyzed into the gas-tight compartment.

PATENT-3 889 185 Not available NTIS
National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
Lightning Current Measuring Systems.
Patent.
R. J. Wojtasinski, J. H. Jones, and R. V. Lisle.
Patented 10 Jun 75, 5p PAT-APPL-461 073
Misc-Filed 15 Apr. 1974 Supersedes N74-22113 (12 - 13, p 1557).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Electric current, *Electrical measurement, *Lightning, Magnetic measurement, *Patents, Wave propagation.
Identifiers: PAT-CL-324-72.

An apparatus for monitoring and analyzing electrical currents produced by lightning strikes is described. The apparatus includes an electrical conductive mast with a circuit coupled to it for generating a dc voltage proportional to a peak current generated in the mast by each lightning strike. Another circuit is coupled to the mast for generating a digital signal representative of the wave shape of the current generated in the mast by each lightning strike, and a third circuit is provided closely adjacent the mast for producing a reference voltage. Signals are fed into a strip chart recorder making a permanent record of the current produced by the lightning strike.

SFB-MHD-12 PC$4.50/MF$2.25
Technische Univ. Berlin (F.R. Germany). Sonderforschungsbereich Magnetohydrodynamik.
Operational Pressure Measurements on Alkali Metal Loops at Temperature Up to 800 exp 0 C by Direct Coupling of the Pressure Transducer.
W. Kaack, P. Schergun, and K. Wagner. Jan 74, 28p
In German. U.S. Sales Only.

Descriptors: (*Coolant loops, *Pressure measurement), (*Pressure gages, *Design), Alkali metals, Performance, Transducers, Very high temperature.

For abstract, see NSA 32 03, number 06583.

TID-26736 PC$4.00/MF$2.25
Westinghouse Electric Corp., Hunt Valley, Md. Nuclear Instrumentation and Control Dept.
Sodium Ionization Leak Detector. Monthly Progress Letter Report for January, 1975.
14 Feb 75, 4p
Contract AT(11-1)-2499

Descriptors: (*Leak detectors, *Performance testing), (*Sodium, *Leaks), Aerosols, Leak testing, Vapors.

No abstract available.

UCRL-50016-75-1 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Mechanical Engineering Department Quarterly Report, January--March 1975.
R. G. Stone, and J. M. Barnett. 31 Mar 75, 17p
Contract W-7405-Eng-48

Descriptors: (*Containment systems, *Closures), (*Actuators, *Design), (*Cryopumps, *Research programs), Beam production, Bearings, Cutting tools, Dielectric materials, Heating, Performance, Plasma.

No abstract available.

UCSD-34P162-6 PC$4.00/MF$2.25
California Univ., La Jolla, San Diego Dept. of Applied Physics and Information Science.
New Materials by Low Temperature Condensation. Final Report.
H. L. Luo. 15 Mar 75, 12p
Contract AT(04-3)-34

Descriptors: (*Superconductivity, *Research programs), (*Magnetism, Research programs), (*Surface coating, Research programs), (*Carbon, Surface coating), Alloys, Amorphous state, Inorganic compounds.

For abstract, see NSA 32 03, number 07002.

14C. Recording Devices

N75-26336/8GA PC$7.50/MF$2.25
Rockwell International Corp., Anaheim, Calif. Electronic Research Div.
Investigation of System Integration Methods for Bubble Domain Flight Recorders.
Final Report, 7 Jun. 1973 - 9 Dec. 1974.
T. T. Chen, and O. D. Bohning. May 75, 240p
NASA-CR-132643, C74-1041/501
Contract NAS1-12435

Descriptors: *Flight recorders, *Tape recorders, Design analysis, Magnet coils, Magnetic fields, Magnetic recording, Magnetic storage, Measure and integration.

For abstract, STAR 1317

PATENT-3 179 533 Not available NTIS
Department of the Army Washington D C
Magnetic Tape with Reinforced Backing.
Patent,
Adolphe Rusch. Filed 4 Oct 61, patented 20 Apr 65, 4p Rept nos. PAT-APPL-142 988,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Magnetic tape, *Patents, Reinforcing materials, Polycarbonates, Glass fibers, Glass reinforced plastics, Acetates, Iron oxides, Coatings.
Identifiers: PAT-CL-117-76.

The patent relates to an improved magnetic tape. It is composed of a backing material of continuous multi-filament glass yarns and/or continuous multi-filament saponified acetate yarns in which the glass and/or saponified acetate yarns are impregnated and bonded with polycarbonate resin and where the impregnated backing material bears on one of its surfaces a coating from a dispersion of magnetic ferric oxide powder in polycarbonate solvent containing some polycarbonate resin.

14D. Reliability

AD-A013 687/9GA PC$4.25/MF$2.25
System Sciences Inc Chapel Hill N C
Research on Statistical Procedures in Reliability Engineering.
Final rept. 1 May 73-30 Jun 74,
Ralph A. Evans, and Gordon Simons. Jun 75, 74p ARL-75-0154
Contract F33615-73-C-4092

Descriptors: *Reliability, *Statistical analysis, *Life tests, Weibull density functions, Sampling, Computations.
Identifiers: Exponential density functions, Maximum likelihood estimation, Pareto density functions, Burr density functions.

The 'time saved on life tests' by using extra items and not waiting until all items fail has been calculated for the exponential, Power-function, and Pareto distributions. The expected values for time ratios are calculated in 3 different ways and the results are quite different. For example, for 7 items tested to the first 3 failures, as compared to 3 items tested to 3 failures, the ratio of expected times is 0.28, whereas the expected ratio is 0.37 (with dependence) and is 0.44 (with independence).

AD-A014 085/5GA PC$4.75/MF$2.25
Pennsylvania State Univ University Park Dept of Statistics
Choice of Model for Reliability Studies and Related Topics III.
Final technical rept. 1 Jul 73-30 Jun 74,
Charles E. Antle, and Lawrence A. Klimko. Jun 75, 81p ARL-75-0133
Contract F33615-73-C-4080
See also report dated Oct 73, AD-772 775.

Descriptors: *Reliability, *Sampling, *Estimates, Weibull density functions, Normal density functions, Tables(Data).
Identifiers: Maximum likelihood estimation, Lognormal density functions, Gamma density functions, Parameter estimation.

This report contains the results of studies of maximum likelihood estimation for the lognormal and gamma models, with emphasis upon the establishment of the existence and uniqueness of the estimators. In addition, ratio of maximized likelihoods tests and modifications of these tests are presented for problems in discriminating among Weibull, lognormal and normal distributions. Tables of critical values and powers are given for some of these tests including in particular the tests for normal vs. lognormal (3 unknown parameters) with complete samples, and tests for Weibull vs. lognormal (2 unknown parameters) with censored or complete samples. These tests are shown to be nearly as powerful as any invariant test. Some consideration is also given to the problem of choosing either the three parameter Weibull or the three parameter lognormal as a model.

14E. Reprography

AD-A013 978/2GA PC$4.25/MF$2.25
Army Engineer Topographic Labs Fort Belvoir Va
Holographic Compensation of Wavefront Aberations in Optical Systems.
Research note Jul 73-Jun 74,
William R. Graver. Jun 75, 56p Rept no. ETL-RN-74-11

Descriptors: *Holography, *Optical lenses, *Optical equipment, Corrections, Diffraction, Optical images.
Identifiers: Abberations, Optical systems.

Holographic compensation of residual aberrations in an experimental optical system is investigated. A series of holographic corrector plates (HCP's) of a given subject lens are constructed for on-axis, monochromatic point sources only. A Hartmann mask is constructed and used to determine the relative effectiveness of the HCP to compensate for point sources that are positioned up to plus or minus 5 degrees off-axis. Although off-axis corrections by the lens/HCP system are more than adequate when compared with the lens alone, hologram diffraction efficiency and vignetting of the diffracted light at the entrance pupil of the lens greatly reduce the HCP effectiveness. To overcome these problems, phase-type holograms having a 40.0 percent diffraction efficiency and secondary HCP's placed directly against the subject lens are constructed. In addition, an HCP repositioning technique based on Moire fringe patterns is developed.

N75-26340/0GA PC$3.75/MF$2.25
Itek Corp., Palo Alto, Calif. Optical Systems Div.

Photographic Equipment Test System (Pets).
Final Report.
17 Jun 75, 28p NASA-CR-141893
Contract NAS9-14460

Descriptors: *Optical measuring instruments, *Photographic equipment, *Photographic recording, Equipment specifications, Systems engineering, Test equipment.

For abstract, STAR 1317

N75-26341/8GA PC$4.25/MF$2.25
Perkin-Elmer Corp., Pomona, Calif. Aerospace Div.
Automatic Exposure Iris Control (Aeic) for Data Acquisition Camera.
Final Report.
G. E. Mcatee, Jr., L. J. Stoap, C. D. Solheim, and J. T. Sharpsteen. Apr 75, 69p NASA-CR-141884, SPO-30284-00800
Contract NAS9-12790

Descriptors: *Automatic control, *Cameras, *Data acquisition, *Irises (Mechanical apertures), Camera shutters, Lens design, Payloads, Space shuttles, Spaceborne photography.

For abstract, STAR 1317

N75-26342/6GA PC$7.00/MF$2.25
Perkin-Elmer Corp., Pomona, Calif. Aerospace Div.
Automatic Exposure Control for Space Sequential Camera.
Final Report.
G. E. Mcatee, Jr., L. J. Stoap, C. D. Solheim, and J. T. Sharpsteen. Apr 75, 184p NASA-CR-141885, SPO-30284
Contract NAS9-12790

Descriptors: *Automatic control, *Cameras, *Exposure, *Space shuttles, Breadboard models, Camera shutters, Design analysis, Focusing, Irises (Mechanical apertures), Remote control, Spaceborne photography.

For abstract, STAR 1317

N75-26343/4GA PC$5.25/MF$2.25
Advisory Group for Aerospace Research and Development, Paris (France).
A Guide to Microfiche Equipment Available in Europe.
Apr 75, 112p AGARD-R-628

Descriptors: *Availability, *Europe, *Microfilms, *Photographic equipment, *Photographic recording, *Projectors, Data storage, Document storage, Microphotographs, Reproduction (Copying), Viewing.

For abstract, STAR 1317

PAT-APPL-518 131/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Quick-Slide Color Process.
Patent Application,
Frederic F. Bigio. Filed 25 Oct 74, 10p
DOCKET/MESA-2236
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Color separation, *Diazo processes.
Identifiers: *Photographic processing, *Black and white film, Photographic negatives.

The patent application relates to the production of color transparencies, and more particularly, to a method for rapidly making full color diazo transparencies. A multicolor diapositive image of an object is made by using subtractive color separation in producing black and white positive transparencies constituting color records of basic colors of the object, and thereafter using the color record transparencies as copy material for corresponding colored transparency film in a diazo printer to produce basic color monochromatic showings of the image which are combined in a registered alignment to effect a multicolored diapositive.

PATENT-3 165 047 Not available NTIS
Department of the Army Washington D C
Photographic Processing Apparatus.
Patent,
Seymour L. Hersh. Filed 1 Mar 62, patented 12 Jan 65, 10p Rept nos. PAT-APPL-176 832,
Previously filed as PAT-APPL-87 505, 6 Feb 61.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Photographic processing equipment, *Patents, Semiautomatic.
Identifiers: PAT-CL-95-77-5.

The patent relates to a machine for handling and processing photographically sensitized elements and particularly to the semiautomatic processing sequence including registering of an original such as a processed negative upon the surface of a sensitized sheet, exposing the sheet through the negative, and processing the exposed sheet.

PATENT-3 167 265 Not available NTIS
Department of the Army Washington D C
Film Reel Drive.
Patent,
Seymour L. Thau. Filed 8 Nov 62, patented 26 Jan 65, 3p Rept nos. PAT-APPL-236 462,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Film transport systems, *Patents, Drives, Reels, Reversible, Tension.
Identifiers: PAT-CL-242-55-12.

The patent provides an improved drive mechanism for feed and take-up reels of a film transport system. It provides an improved, reversible, drive mechanism, for a film or tape transport system, that maintains a constant tension on the tape between the winding and unwinding reels.

PATENT-3 167 429 Not available NTIS
Department of the Army Washington D C
Monobaths Containing Sodium Polyacrylate and Polyvinyl-Pyrrolidone.
Patent,
Marilyn Levy. Filed 26 May 61, patented 26 Jan 65, 2p Rept nos. PAT-APPL-113 041,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, Viscosity, Polymers, Polyacrylates.
Identifiers: PAT-CL-96-61, Polyvinyl pyrrolidone, *Photographic processing chemicals.

This invention relates to a one step processing formula for simultaneous development and fixing of photo-sensitive materials and particularly to such compositions for use at relatively high temperature and containing additives to increase the viscosity thereof. In a previous application a single step processing composition bath for photo-sensitive materials is presented. This bath produces excellent results and creates images having normal density values without excessive fog density and without decrease in film speed. In the present invention the advantages of such a bath are enlarged to apply to those special cases where the bath must have substantial viscosity to avoid spilling.

15. MILITARY SCIENCES

15C. Defense

AD-A013 712/5GA PC$3.25/MF$2.25
Macquarie Univ North Ryde (Australia)
Application of the Fundamental Theorem of Games to an Example Concerning Antiballistic Missile Defense,
John S. Croucher. 1974, 8p
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p197-203 Mar 75.

Descriptors: *Antimissile defense systems, *Game theory, *Reentry vehicles, Terminal defense, Nuclear warheads, Theorems, Probability, Guided missile targets, Kill probabilities, Reprints.

This paper considers a two sided allocation game in which both players initially have fixed resources which may be distributed over various target. Their effectiveness depends on the manner of distribution and also on the strategy of the opponent, a natural payoff function for such a situation being used. The complete solution to the game is derived and a numerical example given. (Author)

PATENT-3 733 597 Not available NTIS
Department of the Army Washington D C
Proximity Detector and Alarm Utilizing Field Effect Transistors.
Patent,
Gerald F. Healey, and Joseph C. Nirschi. Filed 29 Aug 69, patented 15 May 73, 4p Rept nos. PAT-APPL-854 084,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Proximity devices, *Warning systems, *Patents, Personnel detectors, Intrusion detectors, Monitors, Field effect transistors, Antennas, Transients.
Identifiers: PAT-CL-340-258-D, Metal oxide transistors.

The patent describes a proximity detector and alarm in which an antenna is connected to the gate of a metal oxide semiconductor field effect transistor (MOSFET) which causes a silicon controlled switch (SCS) to trigger a blocking oscillator.

15E. Logistics

AD-A013 630/9GA PC$5.75/MF$2.25
Naval Postgraduate School Monterey Calif
Financial Planning and Investments for Military Personnel.
Master's thesis,
James D. Rattan. Jun 75, 146p

Descriptors: *Military personnel, *Money, *Planning, Finance, Statistical data, Theses.

The study discusses the financial problems of the general populace, and how people in the military experience many of those same problems in spite of the considerable benefits they receive. An attempt is made to increase awareness of these problems by a discussion of how and why those in the military often

mismanage their financial affairs. The theses focuses on two common difficulties which often confront service families. In addition, it concentrates on the setting of financial goals and methods of achieving them so that income resources may be more affectively employed and personal financial difficulties averted.

AD-A013 709/1GA PC$3.25/MF$2.25
Montreal Univ (Quebec)
Scheduling with Earliest Start and Due Date Constraints on Multiple Machines,
Paul Bratley, Michael Florian, and Pierre Robillard. 1974, 10p
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p165-173 Mar 75.

Descriptors: *Naval logistics, *Scheduling, *Logistics planning, Mathematical programming, Control sequences, Data processing equipment, Problem solving, Logistics support, Algorithms, Reprints.

AD-A013 713/3GA PC$3.25/MF$2.25
Case Western Reserve Univ Cleveland Ohio
The Knapsack Problem: A Survey,
Harvey M. Salkin , and Cornelis A. de Kluyver. 1974, 19p
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p127-144 Mar 75.

Descriptors: *Naval logistics, *Logistics planning, Algorithms, Naval equipment, Integer programming, Cargo, Dynamic programming, Logistics support, Reprints.
Identifiers: Knapsack problem.

AD-A013 715/8GA PC$3.25/MF$2.25
Carleton Univ Ottawa (Ontario)
Exact First and Second Order Moments of Order Statistics from the Truncated Exponential Distribution,
A. K. Md. Ehsanes Saleh, Christine Scott, and D. Bruce Junkins. 1974, 14p
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p65-77 Mar 75.

Descriptors: *Naval logistics, *Life tests, Statistical analysis, Exponential functions, Covariance, Logistics planning, Naval equipment, Reprints.

AD-A013 716/6GA PC$3.25/MF$2.25
Saskatchewan Univ Saskatoon
Sensitivity of the (Q, R) Inventory Model to Penalty Cost Parameter,
Chandrasekhar Das. 1974, 6p
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p175-179 Mar 75.

Descriptors: *Naval logistics, *Logistics planning, Inventory analysis, Cost analysis, Naval equipment, Stochastic processes, Reprints.

This paper treats an approximate continuous review inventory model with backlogging of excess demand and stochastic leadtime. The major result derived is that the behavior of the optimal order size with respect to the shortage cost parameter is determined solely by the conditional mean residual life function corresponding to the leadtime demand distribution. Some minor results and illustrative examples are also included. (Author)

AD-A013 717/4GA PC$3.25/MF$2.25
Cornell Univ Ithaca N Y
Testing Fit with Nuisance Location and Scale Parameters,
Lionel Weiss. 1975, 10p
Grant NSF-GP-314
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p55-63 Mar 75.

Descriptors: *Naval logistics, *Logistics planning, Life tests, Stochastic processes, Distribution functions, Random variables, Probability, Naval equipment, Reprints.

AD-A013 752/1GA PC$3.25/MF$2.25
American Telephone and Telegraph Co New York Analytical Support Center
Generalized Programming by Linear Approximation of the Dual Gradient: Equality Constraints,
J. Franklin Sharp, and Michael H. Wagner. 1974, 10p
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p145-154 Mar 75.

Descriptors: *Naval logistics, *Logistics planning, *Naval equipment, Quadratic programming, Algorithms, Global, Convergence, Reprints.

A modified generalized programming procedure is presented for solving concave programming problems with equality constraints. The procedure constructs convenient linear approximations of the gradient of the dual and finds points where the approximating functions vanish. In the quadratic programming case, the procedure is finitely convergent. Global convergence is established for the nonquadratic case. Illustrative numerical examples are included. (Author)

AD-A013 802/4GA PC$5.25/MF$2.25
Directorate of Aerospace Studies Kirtland AFB N Mex
Handbook for the Implementation of the Design to Cost Concept.
Final rept.,
Richard H. Anderson, and Thomas E. Dixon. Feb 75, 104p Rept no. SA-TR-75-2

Descriptors: *Government procurement, *Cost analysis, *Management planning and control, Systems analysis, Mathematical models, Reliability, Cost effectiveness, Probability.
Identifiers: *Design to cost, *Project management.

This report documents various models and methodologies in the form of a practical handbook of management tools. These management tools provide a system Program Manager with the means to do the following on a day-by-day basis: (1) Evaluate current system progress; (2) Identify problem areas associated with various subsystems where corrective actions or additional subsystem options are required; (3) Identify subsystems for which a reduction in performance has a small effect on total system performance and investigate if these subsystems can be replaced by lower cost subsystems with the cost savings invested more effectively in the improvement of other more critical subsystems; (4) Select the combination of subsystem options yielding the maximum total system performance achievable at the Design to Cost goal, i.e., optimal allocation of resources; and (5) Evaluate the effect of any proposed change in system design and its impact on Design to Cost goals.

AD-A013 928/7GA PC$3.25/MF$2.25
Air Force Avionics Lab Wright-Patterson AFB Ohio
Cost-Estimating Relationships Using Linear, Log-linear and Non-linear Regression.
Final rept. Aug 74-Jan 75,
J. E. Bilikam. Apr 75, 19p Rept no. AFAL-TR-75-43
See also report dated Feb 74, AD-781 132.

Descriptors: *Cost estimates, *Regression analysis, Radar, Inertial navigation, Computers, Maintenance, Avionics.
Identifiers: *Cost estimating relationships, Log linear density functions.

The report addresses the use of weighted regression for linear cost estimating relationships and non-linear regression for log-linear cost estimating relationships with the trends in residual distributions.

AD-A014 084/8GA PC$17.25/MF$2.25
Office of the Comptroller of the Army Washington D C Directorate of Cost Analysis
Army Force Planning Cost Handbook.
Jun 75, 705p
Includes Change 1 dated Jul 75. Supersedes report dated Oct 74, AD-912 416.

Descriptors: *Army procurement, *Logistics planning, *Cost analysis, Handbooks, Force level, Army equipment, Army budgets, Cost estimates, Management planning and control.
Identifiers: Programming planning budgeting.

The Army Force Planning Cost Handbook (AFPCH) is a product of the Force Cost Information System (FCIS), an automated system designed and maintained by the Office of the Comptroller of the Army (OCA) and the US Army Management Systems Support Agency (USAMSSA). It contains US Army planning factors which can be used in estimating resource requirements and costs associated with Army force structures, missions and activities. Where appropriate, these generalized factors can be identified to the conventional budget structure and the Five Year Defense Program (FYDP).

PATENT-3 157 423 Not available NTIS
Department of the Army Washington D C
Multiple Pallet Unitizing Frame.
Patent,
Emile H. Brie, Sr. Filed 19 Oct 62, patented 17 Nov 64, 10p Rept nos. PAT-APPL-231 876,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pallets, *Containment(General), *Patents, Frames, Structural members, Locking fastener devices, Transportable.
Identifiers: PAT-CL-294-67.

This invention relates to improvements in apparatus for handling palletized cargo and more particularly to a frame structure for holding a number of loaded pallets together to constitute a unitary load for movement by cargo handling equipment such as portable cranes, ship hoisting gear and highway trucks and trailers.

PATENT-3 741 479 Not available NTIS
Department of the Army Washington D C
Drive-Off Aid for Wheeled Vehicles and Method.
Patent,
Predrag Shopalovich. Filed 4 Oct 71, patented 26 Jun 73, 6p Rept nos. PAT-APPL-186 339,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pallets, *Vehicles, *Tracks, *Patents, Air drop operations, Vehicle wheels, Traction.
Identifiers: PAT-CL-238-14.

This invention relates to a drive-off aid for a wheeled vehicle which is adapted for being loaded onto an airdrop platform and supported by stacks of crushable materials. More particularly, the invention relates to a device for application to one or more, but preferably two, tractive wheels of such a vehicle to provide means for enabling the vehicle to be driven off of the platform under its own power despite the hindrance of the stacks of crushable materials.

15G. Operations, Strategy, and Tactics

AD-A013 714/1GA PC$3.25/MF$2.25
Shape Technical Center the Hague (Netherlands)
On a Supplementary Time Variable Approach to Battle Analysis.
Kare M. Mjelde. 1974, 9p
Availability: Pub. in Naval Research Logistics Quarterly, v22 n1 p189-196 Mar 75.

Descriptors: *Naval convoys, *Battles, Vulnerability, Probability, Markov processes, Random variables, Naval logistics, Logistics planning, Merchant vessels, Attack, Reprints.

A supplementary time variable approach is used to analyze a battle where attackers search for defended logistical targets and the future actions of an attacker depend on its activities in the whole time interval since arrival at the operating area. As compared with the method discussed in this paper a corresponding Markov chain analysis of the problem requires a considerably greater number of mathematical relations for state transition probabilities with less possibilities in obtaining numerical solutions effectively and with less parametrical insight. A supplementary time variable is introduced to describe the arrival instants of attackers at the operating area, and is then used to express the probability generating functions of the losses at an arbitrarily selected time instant in terms of a general description of the capabilities of an individual attacker in the time interval since arrival. These capabilities are then related to a selected set of lower level parameters describing a specific battle situation by using a small set of integral relations of the multiple convolution type with solutions expressed as Laplace transforms. (Author)

SAND-74-8242 PC$5.00/MF$2.25
Sandia Labs., Livermore, Calif.
Lanchester Theory in the Context of Tactical Nuclear Warfare.
L. D. Brandt, and R. C. Basinger. May 75, 37p
Contract AT(29-1)-789

Descriptors: (*Warfare, *Mathematical models), Differential equations.

No abstract available.

16. MISSILE TECHNOLOGY

16B. Missile Trajectories

AD-A013 793/5GA PC$4.25/MF$2.25
Arnold Engineering Development Center Arnold Air Force Station Tenn
Axial-Force Measurements on Cone Cylinders Mounted in a Simulated Aeroballistic Range Track in Tunnel F with Application to a Full-Scale System.
Final rept. 1 Jun 74-20 Jan 75,
David E. Boylan. Aug 75, 65p Rept no. AEDC-TR-75-78
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-VKF-TR-75-31.

Descriptors: *Nose cones, *Aeroballistics, Wind tunnel models, Aerodynamic forces, Shock waves, Hypervelocity, Aerodynamic drag.

Axial-force measurements on cone-cylinder models mounted in a simulated aeroballistic range model restraining track system are presented. The data were obtained in the range 15.4 equal to or less than M equal to or less than 19.2 at Reynolds numbers between 0.29 and 1.08 x 1,000,000 per foot. An analytical technique based on inviscid conical flow-field solutions and the experimental data was used to develop an empirical method for estimating the contribution to the model drag from interaction of the model bow shock on the track system and its subsequent reflections back onto the model surface. It is shown that about 15 to 40 percent of total vehicle drag (neglecting sliding friction between the model and the track rails) will be from this shock interaction contribution. Important parameters are cone angle, nose bluntness, model velocity, track dimensions, and range pressure. Calculations are performed over the expected envelope of operation for a full-scale test facility.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-A013 942/8GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Digital Pulse Compression via Fast Convolution.
Journal article,
Peter E. Blankenship, and Edward M. Hofstetter. 26 Mar 74, 14p Rept no. JA-4207
ESD-TR-75-189
Contract F19628-73-C-0002
Availability: Pub. in IEEE Transactions on Acoustics, Speech and Signal Processing, vASSP-23 n2 p189-201 Apr 75.

Descriptors: *Matched filters, *Signal processing, *Acoustic signals, *Pulse compression, *Convolution integrals, Bandwidth, Digital systems, Waveforms, Frequency shift, Real time, Digital filters, Fourier transformation, Linear systems, Simulation, Trade off analyses, Reprints.
Identifiers: *Ambiguity functions, *Digital convolution processor, *Fast fourier transforms, Floating point, Fast convolution, Radix conversion.

The mathematical structure of the digital ambiguity function for a matched filtered linear FM(LFM) waveform is derived as a function of time-bandwidth product, sampling rate, and arbitrary delay and frequency shifts. It is found to be well behaved for sampling rates equal to or greater than the swept signal bandwidth, provided that time sidelobes are controlled using standard frequency domain weighting techniques. A digital convolution processor comprised of cascaded pipeline fast Fourier transforms (FFT's) is presented as a viable architecture for real-time filtering of moderately high bandwidth LFM signals, and tradeoffs among radix, pipeline clock rate, and convolutional efficiency are discussed. It is found that a modified floating-point computational scheme performs well in such a context and is especially useful if a large signal dynamic range must be accommodated. A radix-4 4096-point design example is considered and the effects of quantization and finite register length arithmetic upon the digital ambiguity function are demonstrated via simulation. It is found that input data, FFT coefficients, reference filter coefficients, and intermediate results can be represented with mantissas of modest bit length. (Author)

17B. Communication

AD-A013 597/0GA PC$3.75/MF$2.25
Naval Training Equipment Center Orlando Fla
Design Analysis Report OOD Simulation.
Technical rept. Jul 69-Dec 72,
Edward F. Kashork. Dec 72, 33p Rept no. NAVTRAEQUIPC-IH-197

Descriptors: *Television display systems, *Simulators, Man machine systems, Wide angles, Naval vessels, Handling, Maneuvers, Ship motion, Trainees, Officer personnel, Video signals, Brightness, Resolution, Area coverage, Rasters, Computerized simulation, Training devices, Replenishment at sea, Tankers, Optical images, Ship bows, Vidicons.
Identifiers: Field of view, Officer of the day, Design, AO class vessels.

This report, although preliminary, develops a solution to a shiphandling simulator programmed for an UNREP (Underway Replenishment) operation. Ultrawide angle (70 deg x 180 deg) high brightness, television techniques are employed in the visual display breadboard. The design analysis includes a method for selecting the optics, estimates that the required system resolution should be 246 TV lines vertical and 1110 TV lines horizontal and that a video bandwidth of 40 megahertz would be required. (Author)

AD-A013 626/7GA PC$4.25/MF$2.25
Naval Postgraduate School Monterey Calif
Analysis of Traffic Flow Within a Naval Communication Station.
Master's thesis,
Rita Heustis Bivins. Jun 75, 62p

Descriptors: *Communications traffic, *Message processing, Traffic, Flow, Statistical analysis, Naval shore facilities, Theses.
Identifiers: Military communication.

A study of the message traffic flow at a Naval Communication Station was conducted on two days to determine the percentage of traffic following certain paths within the station, and the characteristics of those paths with regard to traffic volume, precedence, time in house, peak loading periods, and length. Incoming and outgoing messages were matched and sorted by computer. Analysis revealed that the main flow of traffic was incoming on AUTODIN and outgoing on other circuits; approximately 95% of the traffic went out on only one type of channel with little duplication within type of channel; duplication between terminations and broadcasts was minimal; and conflicting results were obtained on variation between path characteristics. Further testing using the described computer program is recommended to provide a broader base for conclusions.

AD-A013 646/5GA PC$6.25/MF$2.25
Shape Technical Center the Hague (Netherlands)
Technical Specifications for Frequency Division Multiplex Equipment and Fixed Microwave Systems.
Consultant rept.
Jun 75, 159p Rept no. STC-CR-NICS-6
NATO furnished.

Descriptors: *Microwave relay systems, *Radio equipment, Multiplexing, Specifications, Frequency modulation, Radiofrequency filters, Automatic gain control, Limiters, Radiofrequency oscillators, Radiofrequency generators, Netherlands, NATO.

Contents:
- General technical specification for fixed line-of-sight FM/FDM radio relay systems and multiplex equipment;
- Microwave systems;
- High grade channel translating equipment;
- Through-group filter equipment;
- Through-supergroup filter equipment;
- Group AGC equipment;
- Supergroup AGC equipment;
- Group signal limiter equipment;
- Supergroup signal limiter equipment;
- Group translating equipment;
- Master oscillator and frequency generation equipment;

Reference pilot supplies generation equipment;
Supergroup translating equipment.

AD-A013 730/7GA PC$7.50/MF$2.25
Purdue Univ Lafayette Ind School of Electrical Engineering
SYMRAP -- A Symbolic Reliability Analysis Program.
Phrase rept.,
P. M. Lin, B. J. Leon, and C. Lisboa. May 75, 244p RADC-TR-75-136
Contract F30602-72-C-0438

Descriptors: *Communications networks, *Reliability(Electronics), Network flows, Mathematical models, Computer programs, Stochastic processes, Switching circuits, Theorems.
Identifiers: Graph theory, SYMRAP computer program, Switching theory, Network analysis theory.

This report describes the major contribution of a research effort to identify methods to be used regarding the collection and processing of data which are required for system control of a switched digital integrated communication network. At the early stages of the effort it was discovered that decisions on data collection could not be made until a good network analysis algorithm was devised. One of the major items needed in the analysis was a fast algorithm for computing terminal-pair reliability for a probabilistic graph. This report describes the algorithm developed as well as presenting a documented computer codes with users manual and examples. The body of the report is written for one who has some familiarity with communications network theory and probabilistic graphs.

AD-A013 767/9GA PC$6.25/MF$2.25
Nicolet Scientific Corp Northvale N J
Enhancing/Intelligibility of Speech in Noisy or Multi-Talker Environments.
Final technical rept. Apr 74-Apr 75,
T. W. Parsons, and M. R. Weiss. Jun 75, 172p RADC-TR-75-155
Contract F30602-74-C-0175

Descriptors: *Speech recognition, Interference, Voice communications, Fourier transformation, Signal to noise ratio, Statistical analysis, Pitch discrimination, Transfer functions.
Identifiers: *Speech intelligibility, *INTEL technique.

Two of the most serious types of interference in speech communications are wideband noise and the speech of a competing talker. This report describes research on techniques for coping with these types of interference. INTEL, a technique for enhancing speech obscured by wideband noise, has now been improved to the point that it will be realistic to implement it as a real-time system for use in practical applications. A technique has also been developed for dealing with interference from a competing talker. (The current technique is restricted to vocalic utterances). Separation is done by selecting the components of the desired voice in the Fourier transform of the input. In implementing this process, techniques have been developed for resolving overlapping spectrum components, for determining pitches of both talkers, and for assuring consistent separation. This report describes the improvements in INTEL and the implementation of the two-talker process, and discusses the prospects for basing a general two-talker process on these techniques.

AD-A013 787/7GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Improvement in Short Wave Fade Detection.
Air Force surveys in geophysics,
David N. Gaunt. 8 May 75, 16p Rept nos. AFCRL-TR-75-0262, AFCRL-AFSG-310

Descriptors: *Communication and radio systems, *Fading(Electromagnetic waves), High frequency, Ionospheric disturbances, Detection.

Certain types of solar emission produce changes in the ionosphere (identified by Short Wave Fades (SWF)) that adversely affect the efficiency of radio communications. The detection of SWF is in principle a relatively simple approach to the measurement of ionospheric changes and the causative solar emissions. In practice, however, numerous factors may compromise the value of SWF data. An improved Short Wave Fade detection system is described which by techniques of frequency sweeping, reduction of unwanted signals by clipping, and enhancement of desired information by integration makes reliable, quantitative, absorption, and spectral information possible.

AD-A013 808/1GA PC$5.25/MF$2.25
Carnegie-Mellon Univ Pittsburgh Pa Dept of Computer Science
Stochastic Modeling as a Means of Automatic Speech Recognition.
Doctoral thesis,
James K. Baker. Apr 75, 116p AFOSR-TR-75-1094
Contract F44620-73-C-0074, ARPA Order-2466

Descriptors: *Speech recognition, *Computer applications, Syntax, Semantics, Phonetics, Acoustic signals, Markov processes, Theses, Signal processing, Network flows.
Identifiers: *DRAGON speech recognition system, HEARSAY systems.

Automatic recognition of continuous speech involves estimation of a sequence X(1), X(2), X(3), ..., X(T) which is not directly observed (such as the words of a spoken utterance), based on a sequence Y(1), Y(2), Y(3), ..., Y(T) of related observations (such as the sequence of acoustic parameter values) and a variety of sources of knowledge. Formally the author wishes to find the sequence x(1:T) which maximizes the a posteriori probability $Pr(x(1:T))=(1:T)\ Y(1:T)=y(1:T),A,L,P,S)$, where A,L,P,S represent the acoustic-phonetic, lexical, phonological, and syntactic-semantic knowledge. A speech recognition system must attempt to approximate a solution to this problem, whether or not the system uses a formal stochastic model. The DRAGON speech recognition system models the knowledge sources as probalistic functions of Markov processes. The assumption of the Markov property allows the use of an optimal search strategy. A simplified implementation of the DRAGON system has been developed using knowledge A and L, and some of the knowledge from S.

AD-A013 865/1GA PC$3.75/MF$2.25
Army Electronics Command Fort Monmouth N J
A Repackaging of the AN/PRR-9 and AN/PRT-4A as a Transceiver.
Research and development technical rept.,
George R. Oliva, Jr., and Glenn S. Williman. Aug 75, 38p Rept no. ECOM-4347

Descriptors: *Transmitter receivers, *Radio transmitters, *Radio receivers, Packaging, Voltage regulators, Antenna radiation patterns, Switching circuits, Electric batteries, Distortion, Whip antennas, Frequency modulation, Very high frequency.
Identifiers: AN/PRT-4A, AN/PRR-9, Communication antennas.

This report describes the development and laboratory testing of a repackaged, hand-held transceiver configuration of the AN/PRR-9 and AN/PRT-4A squad radios. Packaging the receiver and transmitter as a single unit provides an alternative to a new development effort for the squad radio requirement. The chief advantages to this approach are a low cost, and near time solution as compared to a new development effort. Major areas of this repackaging effort are development of an efficient voltage regulator to power the receiver; measurements to determine the suitability of single antenna operation; and a switching scheme between receiving and transmitting. (Author)

AD-A013 989/9GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
Interference-Rejection Properties of a Quantized Correlator Applied to a Kineplex Type of Data Transmission System.
Final rept.,
Jacob J. Freeman. 21 Jul 75, 25p Rept no. NRL-7895

Descriptors: *Data transmission systems, Correlators, Interference, Coding, Message processing, Quantization.
Identifiers: Phase shift keying.

Kineplex typically transmits an ensemble of about 20 pulsed tones, each of which is independently phase-shift keyed in quadrature by two binary streams. The Kineplex receiver employs matched filters using differentially coherent detection. Considerations of weight, cost, and size suggest the use of suboptimum but simpler devices employing quantized correlators (QC). Each tone requires a filter, especially to reduce interference from the unwanted tones. In a time-sampled variant of Kineplex detection, the interference from the unwanted tones can be completely eliminated in principle if the tone frequencies and the number of samples satisfy certain relations. Elimination of interference results from its coherence, which allows samples of the interfering signals to be summed properly so as to cancel. Although a QC injects quantization noise, reducing coherence, a 1-, 2-, 3-bit QC gave probability of error from interference of 0.33 0.03, 0.00003, respectively, for the worst case.

AD-A014 079/8GA PC$3.75/MF$2.25
Defense Communications Engineering Center Reston Va
Control Methodology for Demand Assignment Operation of Satellite Nets.
Technical note,
Nicholas Kyriakopoulos. Mar 75, 44p Rept no. TN-12-75

Descriptors: *Communication satellites, Satellite networks, Communications networks, Management, Control systems, Multiple access.
Identifiers: Defense communication system, Frequency division multiple access, Time division multiple access.

The Defense Communication System (DCS) is an integrated terrestrial and satellite communications system. This report is concerned with the DCS satellite nets which consist of several collections of earth terminals each served by a single spacecraft. There are fundamental differences between the control of commercial and military satellite nets. Network control attains added significance when demand assignment is introduced into the system. As a first step toward the development of a control methodology for the DSCS, a brief review of current and planned multiple access commercial communications systems is presented. It is hoped that subsequent studies will examine similarities and differences between the commercial and military environments. As a result of such analyses a control methodology can hopefully be devised. This report is intended as a small contribution toward the development of a control model for the DSCS.

COM-75-10991/8GA PC$7.25/MF$2.25
Singer Co., New York.
Computer/Communications Networks on a Communitywide Basis.
Final rept.,
Eugene F. Clark, Samuel B. Harvey, Clark B. Robbins, Robert S. Tall, and Spurgeon S. Tyler. Jun 75, 215p NBS-GCR-75-44
Contract C-3-36006

Descriptors: *Closed circuit television, Utilization, Urban areas, Interactions, Standards, Urban development.
Identifiers: *Communications networks, *Computer networks, *Cable television.

The purpose of the study is to project the possible impact of computer/communications networks on a communitywide basis and to make recommendations for action required by government and/or industry in order to take advantage of such networks and, hopefully, avoid some of the problems inherent in their development. The report reviews, in general, the issues involved with the future development of cable television, but it focuses on the nonentertainment, interactive capabilities of cable television as one possible means of wiring the community. The report does not attempt to offer detailed solutions to, or discussions of, specific technical, economic, regulatory, legal, or social problems which may be isolated. The report contains a description of two-way cable services, results of a selected opinion survey, the technical and regulatory status of cable television, an outline of network technology, two future contrasting scenarios, a financial model, and conclusions, recommendations, and standards needed. There is a bibliography of 60 sources.

COM-75-11017/1GA PC$3.75/MF$2.25
National Bureau of Standards, Washington, D.C. Engineering and Product Standards Div.
Tamper-Resistant Television Surveillance System.
Final rept.,
Owen B. Laug, and Kenneth W. Yee. May 75, 39p* NBSIR-75-707
Contract ACDA/RA-126

Descriptors: *Closed circuit television, *Inspection(Arms control), Surveillance, Security, Remote systems, Recording systems, Coding, Nuclear reactors, Facilities, Nuclear materials management.
Identifiers: Safeguards.

The report describes a tamper-resistant television system. This system will be part of a larger system used for verifying compliance with certain international arms control or safeguard agreements. This work is part of a joint U.S.-Canada safeguards research program to develop and evaluate tamper-resistant, tamper-indicating techniques and instrumentation that might be applicable in safeguarding reactors or other nuclear facilities. The principal design objectives are to provide a system capable of unattended operation, data storage capacity for a period up to 90 days, and resistance to deception by insertion of false video information on the transmission line or substitution of false scenes in the camera's field of view. These objectives are accomplished by utilizing commercial high-resolution closed-circuit TV and photography coupled with a video encoding technique which permutes the luminance signal in a different pattern for each recorded picture.

COM-75-11095/7GA PC$4.25/MF$2.25
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
Atmospheric Considerations in Radio System Engineering at 10 to 30 GHz,
C. A. Samson. Jun 75, 72p OTR-75-66
Paper copy also available from GPO.

Descriptors: *Radio transmission, *Atmospheric attenuation, Microwave relay systems, Superhigh frequencies, Precipitation(Meteorology), Polarization, Clouds(Meteorology), Atmospheric refraction, Fog, MW line of sight communication, Microwave communication.

The effects of the atmosphere on radio propagation at frequencies of 10 GHz to 30 GHz include attenuation and depolarization by precipitation, absorption by water vapor and oxygen, and multipath fading related to refractivity gradients in stratified layers. Information is presented on the probable magnitude of the various weather-related effects, considering the differences in radio frequency, geographical location, and climate. The limitations of climatological data are discussed, as well as methods of using the available data in system engineering.

COM-75-11097/3GA PC$7.25/MF$2.25
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
Optimum Reception in an Impulsive Interference Environment,
A. D. Spaulding, and David Middleton. Jun 75, 212p OTR-75-67
Paper copy also available from GPO.

Descriptors: *Radio receivers, *Electromagnetic noise, Optimization, Signal processing, Pulse communication, Radio reception.

The report is devoted to the evaluation of the performance of both optimum and conventional receivers in a broad class of (mostly man-made) electromagnetic interference. Specifically, class A interference is considered, where standard digital signal communications, both coherently and incoherently received, are employed. The new results obtained provide (1) Structures of optimum signal processors in class A EM environments; (2) Performance bounds for such processors and performance estimates for similar, conventional receivers for the same communication tasks.

NTIS/PS-75/669/2GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Speech Intelligibility (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Carolyn Shonyo. Aug 75, 190p*
Supersedes NTIS/PS-75/053.

Descriptors: *Speech, *Bibliographies, *Intelligibility, Voice communication, Auditory perception, Compandor transmission, Pitch(Frequency), Acoustic properties, Underwater acoustics, Speech recognition.
Identifiers: *Speech intelligibility, Helium speech.

The bibliography contains selected references to Federally-funded research reports. The citations contain results of studies on the intelligibility of direct oral communication between humans. The bibliography also cites research on speech transmitted via voice communication systems and equipment. Studies on factors which enhance or interfere with auditory perception of underwater speech and helium speech are included. (Contains 185 abstracts)

NTIS/PS-75/680/9GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Vocoders (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Carolyn Shonyo. Sep 75, 95p*
Supersedes NTIS/PS-75/030.

Descriptors: *Bibliographies, *Vocoders, *Speech, Voice communication, Speech recognition, Simulation, Abstracts.

Government-sponsored research reports are cited on the automatic analysis of speech by vocoders, speech simulation, vocoder design, and related subjects. (Contains 90 abstracts)

N75-26198/2GA PC$4.75/MF$2.25
McDonnell-Douglas Astronautics Co., St. Louis, Mo.
Digital Simulation of a Communication Link for Pioneer Saturn Uranus Atmospheric Entry Probe, Part 1.
C. A. Hinrichs. Feb 75, 80p NASA-CR-137640-PT-1
Contract NAS2-7935

Descriptors: *Atmospheric entry, *Data links, *Digital simulation, *Pioneer space probes, *Planetary atmospheres, Atmospheric models, Doppler radar, Phase demodulators, Phase modulation, Scintillation.

For abstract, STAR 1317

N75-26199/0GA PC$8.50/MF$2.25
McDonnell-Douglas Astronautics Co., St. Louis, Mo.
Digital Simulation of a Communication Link for Pioneer Saturn Uranus Atmospheric Entry Probe, Part 2.
C. A. Hinrichs. Feb 75, 256p NASA-CR-137640-PT-2
Contract NAS2-7935

Descriptors: *Atmospheric entry, *Data links, *Digital simulation, *Pioneer space probes, *Planetary atmospheres, Atmospheric models, Doppler radar, Phase demodulators, Phase modulation, Scintillation.

For abstract, STAR 1317

N75-26200/6GA PC$4.25/MF$2.25
Jet Propulsion Lab., Calif. Inst. of Tech., Pasadena.
Application of Mobile Digital Communications in Law Enforcement, an Introductory Planning Guide.
R. L. Sohn, J. E. Abraham, W. G. Leflang, R. D. Kennedy, and J. H. Wilson. 15 May 75, 68p NASA-CR-142987, JPL-SP-43-6-REV-1
Contract NAS7-100

Descriptors: *Law (Jurisprudence), *Police, *Pulse communication, *Regulations, Cost analysis, Digital techniques, Management planning, Performance.

For abstract, STAR 1317

N75-26203/0GA PC$4.75/MF$2.25
Philco-Ford Corp., Palo Alto, Calif. Western Development Labs. Div.
Sequential Color Video to Parallel Color Video Converter.
Final Report.
20 Feb 75, 84p NASA-CR-141891, WDL-TR5759
Contract NAS9-13781

Descriptors: *Color television, *Data converters, *Spacecraft television, *Video equipment, Breadboard models, Closed circuit television, Flicker, Reliability engineering, Television reception, Weight reduction.

For abstract, STAR 1317

PAT-APPL-589 173/GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Pasadena Office, Calif.
Space Communication System for Compressed Data with a Concatenated Reed Solomon-Viterbi Coding Channel.
Patent Application.
R. F. Rice, and E. E. Hilbert. Filed 23 Jun 75, 40p
NASA-CASE-NPO-13545-1
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Channels (Data transmission), *Coding, *Data compression, *Space communication, Convolution integrals, Deep space network, Equipment specifications, *Patent applications, Pulse modulation, Random noise.

A communication system with a concatenated Reed Solomon-Viterbi coding channel for transmitting compressed and uncompressed data from a spacecraft is described. The system portion in the spacecraft includes a data compressor which compresses data from a source. The compressed data is first coded by a Reed Solomon coder and interleaver, followed by a convolutional encoder, whose output is modulated and transmitted by a modulator/transmitter; antipodal PSK-PM modulation of a square-wave subcarrier with S-band or X-band carrier takes place. The signals transmitted from the spacecraft to earth are assumed to be subjected to wideband Gaussian noise. On earth the system includes several deep space network stations, DSNI-DSNn. Each DSN includes a receiver/demodulator which includes a phase locked loop coherent demodulator with 3-bit quantized symbol output, which is decoded by a Viterbi decoder.

PATENT-3 158 778 Not available NTIS
Department of the Army Washington D C
Phase Modulated Television Camera Tube.
Patent,
Robert H. Johns. Filed 7 Mar 62, patented 24 Nov 64, 2p Rept nos. PAT-APPL-178 214,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Camera tubes, *Patents, Television cameras, Phase modulation, Image orthicons, Noise reduction.
Identifiers: PAT-CL-315-11.

The patent relates to improvements in the circuits and operation of television camera tubes. The invention reduces the noise level by interrupting the beam at a radio frequency rate and makes possible a continuous presentation of the scene by maintaining the beam at such a level that it approaches but does not actually reach the target.

PATENT-3 162 724 Not available NTIS
Department of the Army Washington D C
System for Transmission of Binary Information at Twice the Normal Rate.
Patent,
Otmar E. Ringelhaan. Filed 3 Jul 61, patented 22 Dec 64, 6p Rept nos. PAT-APPL-121 792,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C.

Descriptors: *Pulse communications, *Patents, Digital systems, Binary processors.
Identifiers: PAT-CL-178-68.

The patent relates to an electrical signal communication system using the techniques of biternary transmission for transmitting binary information in less bandwidth than normally required, and more particularly to an improved circuit for forming and decoding the biternary signal used.

PATENT-3 165 588 Not available NTIS
Department of the Army Washington D C
Tune Division Multiplex Digital Communication System Employing Delta Modulation.
Patent,
Johann Holzer, Richard F. Gantges, and Martin Weinstock. Filed 25 Nov 60, patented 12 Jan 65, 10p Rept nos. PAT-APPL-71 839,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pulse communications, *Patents, Digital systems, Time division multiplexing, Delta modulation.
Identifiers: PAT-CL-179-15.

The patent relates in general to digital communication systems and more particularly to digital communication systems whereby analogue information is transmitted by digital means.

PATENT-3 739 082 Not available NTIS
Department of the Army Washington D C
Ordered Dither System.
Patent,
Bernard Lippel. Filed 29 Feb 72, patented 12 Jun 73, 10p Rept nos. PAT-APPL-230 375,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pulse communications, *Patents, Digital systems, Television systems, Pictures, Coding, Quantization, Patterns.
Identifiers: Ordered dither coding, PAT-CL-178-6.

The patent describes an improved system for transmission of either still or moving pictures, with or without scan interlace, and using only coarse quantization of the picture luminance, for conserving transmission channel capacity. This improvement is accomplished by combining the picture with a novel, two-dimensional ordered dither pattern. This pattern is arranged so that, without requiring expensive and complex synchronous subtraction of the dither signal at the receiver, and while operating with coarse quantization, a picture having relatively few disturbing noise structures, and of generally better quality, can be obtained than has been possible with dither systems heretofore.

PATENT-3 889 064 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
Asynchronous, Multiplexing, Single Line Transmission and Recovery Data System.
Patent.
T. O. Anderson. Patented 10 Jun 75, 12p PAT-APPL-455 163
Misc-Filed 27 Mar. 1974 Supersedes N74-19806 (12-11; p 1263). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Channels (Data transmission), *Data retrieval, *Multiplexing, *Satellite transmission, Binary data, *Patents, Synchronism, Transmission circuits.
Identifiers: PAT-CL-179-15-BS.

Asynchronously multiplexed sample data subsystems employ transmission over a single line to a remote synchronizer and demultiplexer. At the remote snychronizer, the data are recovered by synchronizing signals derived from the data itself. A sub-system, or satellite location, supplies continuously sampled binary data along with a satellite identification and synchronizing sequence as a satellite message frame. This information is supplied bit-serially, to a multiplexer junction. The multiplexed satellite information is delivered asynchronously onto a single line transmission channel with other like bit serial satellite message information from other satellite monitoring sites. Such satellite information is transmitted to a central collection and analysis site where it is demultiplexed according to the words and bits that make up a satellite message frame.

PB-243 679/8GA PC$3.75/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
National and Regional Spectrum Management Planning Assistance. Volume I. Summary Report.
Final rept.,
K. D. Felperin, P. D. Shaft, T. L. Humphrey, O. S. Yu, and T. J. Yung. Feb 71, 48p
FCC/OCE/SMTF-71/01-Vol-1
Contract FCC-RC-10121-71
See also Volume 2, PB-243 680.

Descriptors: *Frequency allocations, *Communications management, Regional planning, Radiofrequency interference, Monitoring, Spectrum analysis, Utilization, Radio communication, Automatic.
Identifiers: *Spectrum management, Land mobile radio communications.

The work accomplished is divided into two categories in the report. The first category consists of support in three areas of land mobile policy: evaluation of the consequences of interservice sharing; development of a performance model for optimizing land mobile assignments, given a mix of users of different operational characteristics; and specific recommendations for an improved data base to be obtained from a revised license application. The second category consists of a description of various engineering models to support the assignment of land mobile frequencies by automatic data-processing techniques. Basic algorithms were developed, and benchmark coding was performed to estimate the execution time. To reduce the execution time in the dense land mobile environments that would be encountered in urban areas, special culling and computer organization techniques were developed. The results indicate that frequency assignment by automatic data-processing techniques will be feasible in the proposed regional center.

PB-243 680/6GA PC$8.50/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
National and Regional Spectrum Management Planning Assistance. Volume II.
Final rept.,
K. D. Felperin, P. D. Shaft, T. L. Humphrey, O. S. You, and T. J. Yung. Feb 71, 263p
FCC/OCE/SMTF-71/01-Vol-2
Contract FCC-RC-10121-71
See also Volume 1, PB-243 679.

Descriptors: *Frequency allocations, *Communications management, Regional planning, Radio communication, Radiofrequency interference, Computer programs, Computerized simulation, Utilization.
Identifiers: *Spectrum management, Land mobile radio communications.

Contents:
- An interactive model for determining the utility of various land mobile interservice - sharing proposals;
- On the optimal assignment of users to land mobile channels;
- Interference prediction model;
- Computer benchmark implementation and timing for the interference prediction model;
- Computer organization for culling;
- Evaluation of the computer time required to select a frequency;
- Preprocess culling for the interference computer program.

PB-243 687/1GA PC$5.25/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
Technical Assistance for the FCC National and Regional Spectrum Management Program.
Final rept.,
G. H. Hagn, and T. I. Dayharsh. Jan 73, 105p
SRI-8652-1-F FCC/OCE/SMTF-73/02
Contract FCC-RC-10177
Errata sheet inserted.

Descriptors: *Frequency allocations, *Communications management, Monitoring, Radio communication, Utilization, Data processing, Regional planning.
Identifiers: *Spectrum management, Land mobile radio communications.

The user descriptions included equipment characteristics from catalogs and preliminary user profiles derived by using monitoring data from New York and a special SRI computer program (PROMENADE). A set of sample interview questions was generated to assist the SMTF-C Liaison Section in preparing to obtain additional data on users in the Chicago region. Gap statistics were investigated for suitability in deriving message statistics from transmission statistics.

PB-243 737/4GA PC$4.25/MF$2.25
Stanford Research Inst., Menlo Park, Calif.
Measurements on Modern Land Mobile Transceivers.
Technical note,
Oleg Efremov, and George Hagn. Jul 72, 56p
SRI-TN-18 FCC/OCE/SMTF-72/01
Contract FCC-RC-10177

Descriptors: *Transmitter receivers, Mobile equipment, Frequency modulation, Solid state devices, Sensitivity, Radiofrequency interference, Intermodulation, Very high frequencies, Ultrahigh frequencies.
Identifiers: Land mobile radio communications.

Measurements were performed on modern land mobile transceivers supplied by three different manufacturers to determine: reference sensitivity; interference level from intermodulation products as a function of frequency separation; and transmitter sideband noise. The test solid-state FM transceivers were operated in the 50-, 150-, and 450-MHz bands; the reference sensitivity was measured for all nine transceivers by using the 12-dB SINAD method.

17D. Electromagnetic and Acoustic Countermeasures

AD-A013 625/9GA PC$4.75/MF$2.25
Naval Postgraduate School Monterey Calif
Digital Simulation as an Approach to ESM Software Development.
Master's thesis,
Robert Daniel Stanga, Jr. Mar 75, 95p

Descriptors: *Electronic warfare, *Digital simulation, Computer programming, Compilers, FORTRAN, Signal processing, Interfaces, Theses.
Identifiers: IBM 360 computers.

Selective problem areas relating to computer based Electronic warfare support measures system software development are discussed. Digital simulation is presented as a practical approach to solving software development problems. An algorithm to simulate a hard-wired electronic warfare signal preprocessor is developed. An application oriented high level language version of the algorithm is presented. A FORTRAN program which generates realistic data for signal analysis is described. Using the simulated data, an instruction level simulation program, and a language compiler, the algorithm is tested using an IBM 360 computer.

AD-A013 929/5GA PC$4.25/MF$2.25
Air Force Avionics Lab Wright-Patterson AFB Ohio
Statistics of Electromagnetic Scattering from Chaff Clouds.
Final rept. Jun 73-Mar 74,
Vittal P. Pyati. Apr 75, 56p Rept no. AFAL-TR-74-296

Descriptors: *Chaff, Electromagnetic scattering, Radar cross sections, Autocorrelation, Probability.

Starting from first principles, the first and second order probability densities of the scattered field from chaff clouds are derived. Autocorrelation functions and power spectra of the received voltage, radar cross section and phase are obtained. All the mathematical derivations are explained in full detail. For the simple case of a spherically uniform distribution of relative speed of the dipoles, it is shown that an integral relation exists between the speed distribution function and the intensity auto-correlation function. The utility of second order statistics in studying the effects of chaff clutter fluctuations on advanced radars such as moving target indicator is demonstrated. Finally, numerical results are included both from an actual experiment and calculations based on assumed dipole velocities. Although it was not possible to compare the two unrelated events, there were definite trends of similarity in the data.

17E. Infrared and Ultraviolet Detection

COM-75-50454/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Unfolding First and Second Order Diffracted Radiation When Using Synchrotron Radiation Sources: A Technique.
Final rept.,
E. B. Saloman. Jun 75, 4p
Sponsored in part by National Aeronautics and Space Administration, Washington, D.C.
Pub. in Applied Optics, v14 n6 p1391-1394 Jun 75.

Descriptors: *Synchrotron radiation, *Radiometers, *Standards, *Ultraviolet detectors, Far ultraviolet radiation, Calibrating, Spectrometers, Monochromators, Energy levels.
Identifiers: Reprints.

A technique is presented of using a single calibrated XUV detector for radiometric measurements of synchrontron radiation after the radiation passes through a monochromator that produces a mixture of first and second order diffracted radiation. Irradiance measurements are made with the synchrontron source operating at two different energies for the orbiting electrons. The known change in the spectral distribution produced by the electron energy change is used to calculate the flux in both first and second order. The dependence of the precision of these determinations on the two detected currents and on the detector calibration at both first and second order wavelengths is calculated. Experimental results using the National Bureau of Standards synchrotron (SURF-I) are presented, and anticipated results for the new NBS electron storage ring (SURF-II) are calculated.

EGG-1183-1662 PC$4.00/MF$2.25
EG and G, Inc., Los Alamos, N.Mex.
Digital Processing of Infrared Scanner Data for Radiometric Temperature Analysis of Thermal Plumes.
D. Langner, J. Michael, and D. Wright. 1975, 8p
CONF-750609-1
Contract AT(29-1)-1183

Descriptors: (*Thermal effluents, *Plumes), (*Surry-1 reactor, Thermal effluents), (*Surry-2 reactor, Thermal effluents), (*Surry-3 reactor, Thermal effluents), Aerial monitoring, Data processing, Digital systems, Environment, Infrared spectra, James river, Measuring methods, Nuclear power plants, Surry-4 reactor, Thermal pollution, Water pollution.

For abstract, see NSA 32 03, number 06464.

PB-243 478/5GA PC$4.25/MF$2.25
JRB Associates, Inc., La Jolla, Calif.
Infrared Sensor for the Remote Monitoring of SO2.
Final rept.,
E. R. Bartle, and E. A. Meckstroth. May 75, 55p
EPA/650/2-75-041
Contract EPA-68-02-1208

Descriptors: *Sulfur dioxide, *Gas detectors, *Remote sensing, *Infrared detectors, Air pollution, Monitors, Flue gases, Plume detection, Gas filters, Electric power plants, Performance tests, Gas analysis.
Identifiers: *Air pollution detection.

A prototype passive infrared sensor for the measurement of sulfur dioxide emissions from stationary sources is described. The infrared radiation emitted by gases in a plume originating from smokestacks may be detected, and from this the SO2 concentration in the plume may be determined. In general, the radiation received by the sensor is a function of the intervening and background atmosphere. Thus, the problem of quantitative measurements is generally complex. A technique is described, based upon the principle of Gas Filter Correlation, which minimizes these effects. This report presents a detailed description of the sensor, its specifications, and performance characteristics. The results of field testing at both oil and coal-burning power plants are compared with extractive sample data. In general, the remote measurements agree with the extractive data within + or - 25 percent over SO2 concentrations ranging from 150ppm to 1300ppm from slant ranges of 130 to 400 m.

17G. Navigation and Guidance

AD-A013 579/8GA PC$5.25/MF$2.25
Mitre Corp Mclean Va
Airport Surface Traffic Control Systems Development Analysis - Expanded.
Final rept. Jan 73-Feb 74,
R. A. Bales, and J. F. Koetsch. Mar 75, 115p
FAA-RD-75-51, TSC-FAA-74-26
Contract DOT/TSC-RA-73-11
See also report dated Jan 74, AD-773 699.

Descriptors: *Airport radar systems, *Cost analysis, *Air traffic control terminal areas, Airports, Benefits, Deployment, Surveillance, Search radar, Plan position indicators, Display systems, Traffic, Runways, Taxiways, Visibility, Weather, Aviation safety, Airport control towers.
Identifiers: *ASTC(Airport Surface Traffic Control), *Airport surface traffic control, Benefit cost analysis, DOT/5L, DOT/4CZ/CA.

A previous MITRE Technical Report, Airport Surface Traffic Control Systems Deployment Analysis, FAA-RD-74-6, presented an analysis of ASTC (Airport Surface Traffic Control) system requirements and developed estimates of the deployment potential of proposed ASTC system alternatives for 19 air carrier airports. The primary requirement was determined to be improved surveillance which resulted in an estimated deployment of one of two surveillance systems at 16 airports by 1980. This report presents an expansion of that deployment analysis to include a total of 39 air carrier airports. The methods and assumptions for the deployment analysis of the 20 airports presented in

this report are essentially the same as in the initial report. The overall result of the analysis is that by the initial deployment date (1976-1980) of the two alternative surveillance systems, the total potential market will be for 20-25 systems. By the end of the century, the total potential market for ASTC surveillance systems will exceed 30.

AD-A013 651/5GA PC$3.25/MF$2.25
Naval Electronics Lab Center San Diego Calif
VLF Navigation Monitor: Purpose and Function.
Final rept. Dec 73-May 75,
E. R. Swanson. 30 May 75, 18p Rept no. NELC-TR-1955
Contract DOT-FA74WAI-425

Descriptors: *Hyperbolic navigation, *Monitors, Very low frequency, Omega navigation, Aviation safety, Errors.
Identifiers: DOT/4IZ/ID.

An overview of the need for and the design of a vlf navigation monitor is presented. Fundamental errors associated with various vlf navigational techniques are discussed briefly; 2-mile accuracy or better is assumed typical. Safe operation within existing airways is normally possible, but protection against propagationally induced blunders should be provided by a navigation monitor. The monitor can be designed so as to provide not only disturbance warning but also disturbance prediction. The monitor can also assist in preflight.

AD-A013 755/4GA PC$3.25/MF$2.25
California Univ Los Angeles Dept of Engineering Systems
Use of Single Star Sightings in Boost Navigation,
Cornelius T. Leondes, and Jeffrey M. Nash. 1 May 74, 7p AFOSR-TR-75-1109
Grant AF-AFOSR-2166-72
Availability: Pub. in Jnl. of Spacecraft and Rockets, v12 n1 p54-58 Jan 75.

Descriptors: *Navigation, Celestial navigation, Inertial measurement units, Accelerometers, Gyroscopes, Star trackers, Alignment, Calibration, Spacecraft, Reprints.

Information obtained from a single inflight star sighting is used to calibrate a boost vehicle's IMU errors. Several error-inducing parameters, including initial alignment, accelerometers, and gyros are included in the estimation state vector. Although the problem studied in shown to be generally unobservable suitable preflight alignment techniques can be used to induce observability.

AD-A013 798/4GA PC$4.75/MF$2.25
Facility Checking Squadron (1866th) (Afcs) Richards-Gebaur AFB Mo
TRACALS Evaluation Report. Radar Station Evaluation Report, Dobbins AFB, Georgia, 16 - 29 Mar 75,
David E. Smith. 18 Jun 75, 95p Rept no. 75/66R/36

Descriptors: *Airport radar systems, *Air traffic control systems, Radar stations, Search radar, Radar beacons, Georgia, Air Force facilities, Performance.
Identifiers: AN/MPN-13, Evaluation, Dobbins Air Force Base.

The Traffic Control and Landing System (TRACALS) radar station evaluation report presents data collected to define the capabilities and limitations of the Ground Control Approach (GCA) facility located at Dobbins AFB, GA. The Dobbins facility is comprised of an AN/MPN-13. Incorporated into this system are an Air Surveillance Radar (ASR), an Air Traffic Control Radar Beacon System (ATCRBS), a Precision Approach Radar (PAR), and associated power systems. Included in this report are performance results and predictions. The contents of this report should be used as a guide for anticipated performance until there is an addition, deletion, or relocation of equipment which could change the facility's present configuration.

AD-A013 799/2GA PC$3.75/MF$2.25
Facility Checking Squadron (1866th) (Afcs) Richards-Gebaur AFB Mo
TRACALS Evaluation Report. Ground/Air/Ground Communications Special Evaluation Report. 407L Tactical Air Control System. 8 April-1 May 1975,
Bruce E. Wallachy. 25 Jun 75, 30p Rept no. 75/66S/38

Descriptors: *Air traffic control systems, *Communication and radio systems, Performance, Antenna radiation patterns, Air Force facilities, Florida, South Carolina.
Identifiers: Evaluation, An/TRC-87, AN/TSC-62.

The report contains the results of a special evaluation performed on the Ground/Air/Ground communications component of the 407L Tactical Air Control System. The evaluation was conducted on equipment located at Homestead AFB, FL, MacDill AFB, FL, and Shaw AFB, SC from 8 April to 1 May 1975. Included in the report are equipment performance results, radiation pattern measurements, and discussion of equipment operation. System alignment procedures and signal level diagrams are presented for troubleshooting/fault isolation reference and optimum system alignment.

AD-A013 800/8GA PC$3.75/MF$2.25
Facility Checking Squadron (1868th) (Afcs) Apo New York 09332
TRACALS Evaluation Report. Special Evaluation Report. Determination of the TACAN Interference Field in the Installed Environment,
Terry W. Selby. 22 Apr 75, 47p Rept no. 75/68T/13

Descriptors: *Tacan, Interference, Antenna radiation patterns, Nulls(Amplitude).
Identifiers: Evaluation.

The report provides procedures for determining the TACAN interference field for facilities with a siting environment consisting of a flat or a sloping reflecting surface. The airborne evaluation data verified the analytical procedures for calculating the null structure and indicated degradation of the received signal in the predicted null areas. A means of calculating the vertical profile of the interference field for a constant signal strength is also presented. This report includes evaluation methods, analysis techniques, and actual flight data used to verify these procedures.

AD-A013 803/2GA PC$3.25/MF$2.25
Mitre Corp Atlantic City N J
Interface Definition DABS Engineering Model/ATC (NAFEC),
Robert D. Geoghan, Jr. Sep 74, 8p Rept no. MTR-4221-Vol-1 FAA-RD-74-159-1
Contract DOT-FA69NS-162

Descriptors: *Air traffic control systems, Interfaces, Engineering, Models.
Identifiers: DOT/4IZ/ID, DABS(Discrete Address Beacon Systems), *Discrete address beacon systems.

The document introduces a series of documents that describe the DABS engineering model/Air Traffic Control (ATC)/Digital Simulation Facility (DSF) interfaces at NAFEC. The ATC systems at NAFEC are the NAS Enroute System Support Facility (SSF) and the Terminal Automation Test Facility (TATF). These systems along with the DSF and the DABS engineering models will become part of a test bed that will be used for development test activities in support of upgrading the Enroute and Terminal Air Traffic Control Systems.

AD-A013 810/7GA PC$3.75/MF$2.25
Mitre Corp Atlantic City N J
Interface Definition DABS Engineering Model/ATC (NAFEC). Volume II-Series 1-Enroute Data Formats.
Robert D. Geoghan, Jr. Mar 75, 32p Rept no. MTR-4221-Vol-2-Ser-1 FAA-RD-74-159-2
Contract DOT-FA69NS-162
See also Volume 1, AD-A013 803 and Volume 3, AD-A013 811.

Descriptors: *Air traffic control systems, Interfaces, Formats, Engineering, Models, Beacons.
Identifiers: DOT/4IZ/ID, *Discrete address beacon systems, DABS(Discrete Address Beacon Systems).

The document describes the surveillance and communication message formats for the interface between the Discrete Address Beacon System (DABS) Engineering Models and the NAS Enroute System at NAFEC. This interface will be used for IPC Phase II testing and development testing of the DABS system. There are five volumes to this report, with varying issue dates.

AD-A013 811/5GA PC$3.75/MF$2.25
Mitre Corp Atlantic City N J
Interface Definition DABS Engineering Model/ATC (NAFEC). Volume III-Enroute Hardware Configuration.
Robert D. Geoghan, Jr. Sep 74, 46p Rept no. MTR-4221-Vol-3 FAA-RD-74-159-3
Contract DOT-FA69NS-162
See also Volume 2, Series 1 dated Mar 75, AD-A013 810.

Descriptors: *Air traffic control systems, Interfaces, Engineering, Models, Data processing equipment.
Identifiers: DOT/4IZ/ID, DABS(Discrete Address Beacon Systems), Discrete address beacon systems.

The document defines the interfaces between the DABS Engineering Models to be installed at or near NAFEC and the enroute System Support Facility (SSF) at NAFEC. The interfaces for handling the one-way surveillance reports and the interface for handling the two-way communication messages are described. The configuration defined here will be used as a test bed during Phase II of the DABS development program.

AD-A013 916/2GA PC$19.75/MF$2.25
Test Group (6585th) Holloman AFB N Mex
Proceedings of the Biennial Guidance Test Symposium (7th) Held at Headquarters 6585th Test Group, Air Force Special Weapons Center, Holloman Air Force Base, New Mexico on 14 - 16 May 1975. Volume I.
May 75, 876p AFSWC-TR-75-26-Vol-1

Descriptors: *Inertial guidance, *Inertial navigation, *Meetings, Gyroscopes, Accelerometers, Inertial systems, Inertial measurement units, Terminal guidance, Navigational aids.
Identifiers: *Ring laser gyroscopes, *Ring lasers.

These proceedings contain papers included in the Seventh Biennial Guidance Test Symposium. This symposium, hosted by the Central Inertial Guidance Test Facility, is directed toward the exchange of information, stimulation of new ideas, and discussion of recent developments in the field of guidance testing. The papers presented in these proceedings include such topics as aircraft inertial navigators,

strapped-down guidance systems, component evaluation, and analysis techniques. The included papers were those presented in the unclassified session of the symposium.

AD-A013 995/6GA PC$3.75/MF$2.25
National Aviation Facilities Experimental Center Atlantic City N J
Frangibility Tests of Existing Approach Lamps and Holders.
Interim rept. Jul-Dec 74,
Bret B. Castle. Aug 75, 44p Rept no. FAA-NA-75-8 FAA-RD-75-97

Descriptors: *Approach lights, *Aircraft landings, *Impact tests, Test methods, Frangible, Holders, Velocity, Collisions, Windshields, Simulation, Catapults, Fuselages.
Identifiers: *Small aircraft, Runway undershooting, Frangible lighting structures.

One of the hazards encountered when flying into a major airport today is the possibility of accidentally undershooting the threshold of the runway and impacting into present-day approach lighting systems located there. Tests were conducted on approach lamps and holders to determine to what extent current designs are frangible. A catapult accelerated the fuselages of two widely used types of small aircraft to collision with PAR-38 and PAR-56 lamps and associated holders. 53 runs at different speeds and with different exposed lamp face orientations were made. Results show that a safety redesign of the lamps might reduce penetration probability and result in a lamp that will not penetrate windshields at less than approach landing speeds.

AD-A014 071/5GA PC$5.25/MF$2.25
Naval Electronics Lab Center San Diego Calif
Omega Measurements: Fuchu, Japan. Omega VLF Phase Difference Data Series. Volume 12. Data for Period February 1968-December 1969,
E. R. Swanson, C. P. Kugel, and E. J. Hendricks. 7 Apr 75, 102p Rept no. NELC/TD-402
See also Volume 16, AD-A014 072.

Descriptors: *Omega navigation, *Phase measurement, Very low frequency, Radio signals, Data acquisition, Japan, Phase control, Monitoring, Synchronization(Electronics).
Identifiers: Omega navigation system, DOT/4IZ/ID.

This is one of a series of 27 volumes (NELC TD 391-417) presenting measurements of the relative phase difference of signals from various pairs of Omega stations as observed at several monitoring sites around the world. The volume includes measurements made in 1968 and 1969. Remote transmitters include Hawaii and Norway.

AD-A014 072/3GA PC$4.75/MF$2.25
Naval Electronics Lab Center San Diego Calif
Omega Measurements: Tananarive, Madagascar. Omega VLF Phase Difference Data Series. Volume 16. Data for Period September 1969-December 1970,
E. R. Swanson, C. P. Kugel, and E. J. Hendricks. 7 Apr 75, 87p Rept no. NELC/TD-406
See also Volume 18, AD-A014 073.

Descriptors: *Omega navigation, *Phase measurement, Very low frequency, Radio signals, Data acquisition, Madagascar, Phase control, Monitoring, Synchronization(Electronics).
Identifiers: Omega navigation system, DOT/4IZ/ID.

This is one of a series of 27 volumes (NELC TD 391-417) presenting measurements of the relative phase difference of signals from various pairs of Omega stations as observed at several monitoring sites around the world. This volume descirbes measurements made in 1969 and 1970. Remote transmitters include Norway and Trinidad.

AD-A014 073/1GA PC$4.25/MF$2.25
Naval Electronics Lab Center San Diego Calif
Omega Measurements: FAA Flights, North-South America. Omega VLF Phase Difference Data Series. Volume 18. Data for Period May 1966-March 1967,
E. R. Swanson, C. P. Kugel, and E. J. Hendricks. 7 Apr 75, 53p Rept no. NELC/TD-408
See also Volume 19, AD-A014 074.

Descriptors: *Omega navigation, *Phase measurement, Very low frequency, Radio signals, Data acquisition, North America, South America, Phase control, Monitoring, Synchronization(Electronics).
Identifiers: Omega navigation system, DOT/4IZ/ID.

This is one of a series of 27 volumes (NELC TD 391-417) presenting measurements of the relative phase difference of signals from various pairs of Omega stations as observed at several monitoring sites around the world. The data in this volume were obtained from published reports of extensive Omega monitoring at 21 major airports throughout North and South America during the period from May 1966 to March 1967. In addition to obtaining fixed-site data, the purposes of the experiment were to determine the effect of precipitation static on the reception of Omega signals in aircraft and to investigate the problems of lane identification in the Omega system.

AD-A014 074/9GA PC$3.25/MF$2.25
Naval Electronics Lab Center San Diego Calif
Omega Measurements: Texas. Omega VLF Phase Difference Data Series. Volume 19. Data for Period March-November 1966,
E. R. Swanson, C. P. Kugel, and E. J. Hendricks. 7 Apr 75, 25p Rept no. NELC/TD-409
See also Volume 20, AD-A014 075.

Descriptors: *Omega navigation, *Phase measurement, Very low frequency, Radio signals, Data acquisition, Texas, Phase control, Monitoring, Synchronization(Electronics).
Identifiers: Omega navigation system, DOT/4IZ/ID.

This is one of a series of 27 volumes (NELC TD 391-417) presenting measurements of the relative phase difference of signals from various pairs of Omega stations as observed at several monitoring sites around the world. The data were obtained to evaluate the possible application of Differential Omega techniques to separation distances of up to 300 nmi. Data were obtained continuously at Tracor headquarters in Austin, Texas, while two identical mobile monitor trailers simultaneously obtained data at two other sites for about 5 days each. Five pairs of these 'simultaneous' sites exist, resulting data from 11 sites over the period 21 October to 27 November 1966. Also documented are additional data taken at the Tracor headquarters building in March and June of 1966 with earlier models of the 599 series vlf receiver.

AD-A014 075/6GA PC$4.25/MF$2.25
Naval Electronics Lab Center San Diego Calif
Omega Measurements: Miami, Florida. Omega VLF Phase Difference Data Series. Volume 20. Data for Period January 1970-December 1970,
E. R. Swanson, C. P. Kugel, and E. J. Hendricks. 7 Apr 75, 72p Rept no. NELC/TD-410
See also Volume 12, AD-A014 071.

Descriptors: *Omega navigation, *Phase measurement, Very low frequency, Radio signals, Data acquisition, Florida, Monitoring, Phase control, Synchronization(Electronics).
Identifiers: Omega navigation system, DOT/4IZ/ID.

This is one of a series of 27 volumes (NELC TD 391-417) presenting measurements of the relative phase difference of signals from various pairs of Omega stations as observed at several monitoring sites around the world. The volume describes measurements from January 1970 through December 1970. Remote transmitters include Hawaii, New York, Norway, and Trinidad.

COM-75-11104/7GA PC$8.50/MF$2.25
National Ocean Survey, Rockville, Md.
United States Coast Pilot 3, Atlantic Coast, Sandy Hook to Cape Henry. Thirteenth Edition, July 1975.
Jul 75, 259p NOAA-75072225
Supersedes report dated Jul 74, COM-74-50994.

Descriptors: *Navigation, *Waterways(Transportation), *Navigational charts, *Atlantic coast, Regulations, Weather communication, Oceanographic surveys, Anchorages, Channels(Waterways), Merchant ships, Seaports, Oceanographic ships, Sandy Hook, Cape Henry, Tables(Data), Sea ice.
Identifiers: Intracoastal waterways.

The National Ocean Survey Coast Pilots are a series of nautical books that cover a wide variety of information important to navigators of United States coastal and intracoastal waters. Most of this information cannot be shown graphically on standard nautical charts and is not readily available elsewhere. Coast pilot subjects include navigation regulations, outstanding landmarks, channel and anchorage peculiarities, dangers, weather, ice, freshets, routes, pilotage, and port facilities. Coast pilots are based upon field inspections conducted by the National Ocean Survey, information published in Notices to Mariners, and reports from NOAA survey vessels, other Government agencies, State and local governments, maritime and pilotage associations, port authorities, mariners, and others.

N75-25901/0GA PC$8.50/MF$2.25
Massachusetts Inst. of Tech., Cambridge. Dept. of Aeronautics and Astronautics.
Flight Test and Evaluation of omega Navigation for General Aviation.
P. V. Hwoschinsky. Jun 75, 266p NASA-CR-132677
Contract NGL-22-009-640

Descriptors: *Flight tests, *General aviation aircraft, *Omega navigation system, Ground based control, Hyperbolic navigation, Position (Location), Radio receivers, Radio waves, Systems analysis.

For abstract, STAR 1317

PATENT-3 889 264 Not available NTIS
National Aeronautics and Space Administration. Pasadena Office, Calif.
Vehicle Locating System Utilizing AM Broadcasting Station Carriers.
Patent.
G. R. Hansen, Jr.. Patented 10 Jun 75, 15p PAT-APPL-362 145
Misc-Filed 21 May 1973 Supersedes N73-26144 (11 - 17, p 1997). Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Broadcasting, *Position (Location), *Radio transmitters, *Surface vehicles, Cartesian coordinates, *Patents, Radio receivers, Signal transmission.

Identifiers: PAT-CL-343-105-R.

A vehicle locating system is disclosed which uses the carrier signals of unsynchronized commercial AM broadcasting stations to form hyperbolic isophase grid lines. Each vehicle is equipped with a three-channel receiver, and each channel is tuned to a different one of three spaced apart stations, in order to provide to a central station, information of motion from a known position by counting isophase lines crossed. A stationary receiver similarly counts isophase lines, which cross some fixed location due to drift in the transmission of the unsynchronized stations, and provide drift information which is subtracted from the vehicle motion information.

17H. Optical Detection

PAT-APPL-499 103/GA PC$3.25/MF$2.25
Department of the Interior, Washington, D.C.
Transmitter-Receiver System.
Patent Application,
Filed 20 Aug 74, 16p DOCKET/MIN-2149
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Transmitter receivers, *Patent applications, *Optical radar, Lasers, Light emitting diodes, Guidance.

The patent application describes an optical transmitter-receiver system which is particularly adapted for use in vehicle guidance, obstacle detection and the like. The system includes a laser diode transmitter including a modulation circuit comprising a bank of transistors that are individually triggered into the avalanche mode so that energy stored by a capacitive storage network is discharged into the diode. In accordance with a first receiver embodiment, which includes a range flip-flop controlled by a threshold comparator, an analog voltage proportional to range is produced. In a second receiver embodiment, the receiver responds to targets within a prescribed zone determined by an analog gated amplifier.

17I. Radar Detection

AD-A013 648/1GA PC$5.75/MF$2.25
ITT Electro-Physics Labs Inc Columbia Md
Tracker Studies.
Final rept. Feb-Dec 74,
R. N. DeWitt. Jun 75, 140p Rept nos. ITT-EPL-278, CB-115
Contract N00014-74-C-0106

Descriptors: *Over the horizon detection, *Radar tracking, Kalman filtering, Electromagnetic wave propagation, Filters, High frequency, Multimode.

The existence of multi-mode propagation can have two deleterious effects on an OTH radar tracker; it can lead to ambiguity in the interpretation of the range of detected targets, and it can lead to difficulties in determining from a single detection sample, any testing to determine mode identity must be performed at or beyond the tracker. Three methods are considered for identifying propagation modes; one based on testing for the occurrences of echoes in regions or combinations of regions of the radar-observable space accessible to only a single propagation mode, another based on the amplitude fluctuations observed on echoes, and a third in which mode separations are tracked and taken into account. Predictive filters are given general treatment. The Kalman filter tracking algorithm is discussed with the modifications required to implement the first and third (above) mode-identification techniques. The use of signal strength fluctuations as a mode-identification criterion is examined and dismissed as being insufficiently predictable to provide a reliable means for identifying propagation modes.

AD-A013 659/8GA PC$3.75/MF$2.25
Naval Postgraduate School Monterey Calif
Moving Target Indication by Noncoherent Detection.
Master's thesis,
Isaac Levin. Jun 75, 44p

Descriptors: *Moving target indicators, *Search radar, *Intermediate frequency amplifiers, Airborne, Radar clutter, Modulation, Theses, Simulation, Weight.
Identifiers: AN/UPS-1, Noncoherent radar, Design.

An IF amplifier and detector were designed for a noncoherent MTI radar. The amplifier was designed to satisfy the following two requirements: (A) The amplifier must not overload; saturation due to large signals is not permitted. (B) When strong clutter is present, the amplifier must amplify the peak of the signal, since the effects due to small moving targets are carried in the peak of the resultant signal. The performance of the AN/UPS-1 air search radar, operated as a noncoherent MTI system with the modified IF amplifier, was checked. This modification provides increased sensitivity for the noncoherent MTI radar over a radar employing a logarithmic IF amplifier. The advantage of noncoherent MTI is its simplicity. It is therefore attractive for those applications where space and weight are limited. It is also attractive for airborne applications since no compensation is required for radar motion. (Author)

AD-A013 731/5GA PC$4.75/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Ionospheric Limitations on Radar Accuracy at L-Band.
Technical note,
Ronald H. Wand. 27 May 75, 81p Rept no. TN-1975-28 ESD-TR-75-175
Contract F19628-73-C-0002
See also AD-781 179, AD-782 748 and AD-780 519.

Descriptors: *Radar, L band, Electromagnetic wave propagation, Errors, Ionosphere, Electron density, Ionospheric disturbances, Scintillation, Aurorae.
Identifiers: Millstone Hill radar.

For a long-range radar system the target range and bearing, as well as the signal amplitude and phase, are altered to some degree by the presence of the earth's atmosphere and ionosphere. The irregular nature of the ionosphere controls the extent to which these errors can be predicted and compensated for. The limits on radar metric accuracy imposed by ionospheric propagation effects are evaluated with emphasis on an L-band radar situated near the auroral zone. Many of the results are derived from previous progagation studies conducted at the Millstone Hill radar facility by applying appropriate frequency scaling laws. Estimates are made of elevation and range errors associated with the ambient ionosphere and with large-scale ionospheric structures (such as the mid-latitude electron density trough and traveling ionospheric disturbances). The amplitude and angle-of-arrival fluctuations produced by ionospheric scintillation are considered and models constructed which are applicable for normal ionospheric conditions and also for periods of severe geomagnetic disturbance.

AD-A013 733/1GA PC$4.75/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Evaluation of Probability of Detection for Several Target Fluctuation Models.
Technical note,
David A. Shnidman. 8 Jul 75, 80p Rept no. TN-1975-35 ESD-TR-75-109
Contract F19628-76-C-0002

Descriptors: *Target detection, Radar targets, Probability, Mathematical models, Computer programs, FORTRAN.

Highly efficient algorithms have been derived for calculating the probability of detection, P sub D, for several target fluctuation models. These include the Marcum model (constant target cross section) and the four Swerling models (chi-squared fluctuations). Programs are presented in computer free notation as well as FORTRAN (for accuracies of 0,000001 and 10 to the minus 12 power for each of the models. In addition, an approximate expression for the elevation of P sub D, applicable when the target return is constant during a scan but exhibits log-normal fluctuation from scan-to-scan, is presented, together with a listing of a FORTRAN program that evaluates the expression. An efficient iterative routine for the determination of the threshold from the probability of false alarm is also included.

AD-A013 734/9GA PC$4.75/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
The ARIES Program: Analysis and Generation of Simulated Radar Measurements.
Technical note,
James L. Mannos, and Joseph L. Katz. 9 Jul 75, 89p Rept no. TN-1975-16 ESD-TR-75-222
Contract F19628-76-C-0002

Descriptors: *Radar tracking, Computerized simulation, Noise(Radar), Errors, Atmospheric refraction, Scintillation, Monte Carlo method, Radar cross sections, FORTRAN, Multipath transmission.
Identifiers: ARIES computer program, Ionospheric scintillations, CDC 6600 computers.

The report describes the modeling of measurement errors in precision, long range tracking radars due to the combination of environmental effects and variations in target cross section. The environmental effects considered are tropospheric and ionospheric refraction and time delay, ionospheric scintillation, and multipath through the sidelobes at low tracking angles. In addition, radar errors due to thermal and galactic noise, equipment jitter, and bias are included. Six-degree-of-freedom vehicle dynamics are modeled to realistically represent the changing radar cross section due to target dynamics such as tunbling and precession.

AD-A013 765/3GA PC$3.25/MF$2.25
Aerospace Corp El Segundo Calif Engineering Science Operations
Application of 0-1 Integer Programming to a Track Assembly Problem,
C. L. Morefield. 16 Apr 75, 24p Rept no. TR-0075(5085-10)-1 SAMSO-TR-75-186
Contract F04701-74-C-0075

Descriptors: *Radar tracking, *Track while scan, *Integer programming, Mathematical models, Real time, Algorithms, Computations.

Multiple-target tracking in high target density situations can be posed as a multi-hypothesis decision problem. The complete solution of such problems on a real time basis requires that the computations be carried out in a computer-efficient manner. This paper discusses a formulation of the tracking problem based on 0-1 integer programming. Such a formulation can markedly reduce computer time requirements.

AD-A013 791/9GA PC$4.25/MF$2.25
Parke Mathematical Labs Inc Carlisle Mass
A Computer Simulation Scheme for an Aircraft Moving Target Indication System. Part I.
Interim rept.,

Theodore B. Barrett. Jun 75, 52p Rept no. Scientific-1 AFCRL-TR-75-0313
Contract F19628-73-C-0125

Descriptors: *Moving Target Indicators, Computerized simulation, Subroutines, Radar clutter, Signal processing, Video signals.

This is the first part of the general description of several computer subroutines which have been written for use in an AMTI radar simulation scheme. Chapter I describes the overall system which allows many simulator components to be conveniently interconnected. In addition, a scheme for displaying results is described. Chapter II is a detailed description of the clutter and moving target signal simulator. This device is the front end of the overall simulation scheme.

AD-A013 980/8GA PC$3.75/MF$2.25
Army Missile Research Development and Engineering Lab Redstone Arsenal Ala Advanced Sensors Directorate
Tracking Accuracies of Sequentially Lobed Radars on Fluctuating Targets.
Technical rept.,
J. M. Loomis, and M. D. Fahey. 10 Jun 75, 47p Rept no. RE-75-34

Descriptors: *Radar tracking, Accuracy, Arrays, Frequency, Scanning, Radar cross sections, Scintillation, Errors, Computerized simulation, Computer programs.

The effect of amplitude scintillation on a sequential lobing tracker has been analyzed. It is shown that, the angular tracking accuracy is limited by the amount of target fluctuation if the target return signal fluctuates. A loss-of-track condition is found and is shown to give the same output as would be obtained from a Rayliegh distributed return signal. The report further shows that tracking targets with Swerling type I fluctuations is virtually impossible, while the tracking of type III target is marginal. These results have direct application for a frequency scanned array which uses sequential lobing to angle track, because changing frequency will produce scintillation of target cross section, causing the return signal to fluctuate.

N75-26209/7GA PC$3.75/MF$2.25
Forschungsinstitut fuer Funk und Mathematik, Werthoven (West Germany).
Elras: A Real Time Simulation System for Electronically Controlled Radar Elras, Ein Echtzeitsimulationssystem fuer Elektronisch Gesteuertes Radar.
G. Vankeuk. Jul 74, 37p REPT-222
In German; English Summary.

Descriptors: *Computerized simulation, *Electronic control, *Phased arrays, *Radar antennas, *Real time operation, Data processing, Digital computers, Radar scanning.

For abstract, STAR 1317

N75-26478/8GA PC$6.25/MF$2.25
Kansas Univ. Center for Research, Inc., Lawrence.
Rough Surface Scattering Based on Facet Model.
H. R. Khamsi, A. K. Fung, and F. T. Ulaby. Nov 74, 158p NASA-CR-141869, RSL-TR-177-52
Contract NAS9-10261

Descriptors: *Ground effect, *Radar scattering, *Surface roughness, Alfalfa, Mathematical models, Normal density functions, Radar cross sections, Spectrometers, Wavelengths.

For abstract, STAR 1317

N75-26846/6GA PC$4.75/MF$2.25
Kansas Univ. Center for Research, Inc., Lawrence. Remote Sensing Lab.
MAS2-8 Radar and Digital Control Unit.
J. M. Oberg, and F. T. Ulaby. Oct 74, 99p NASA-CR-141867, RSL-TR-177-37
Contract NAS9-10261

Descriptors: *Digital radar systems, *Microwave sensors, *Radar receivers, *Spectrometers, Computer programs, Control boards, Data acquisition, Data systems, Frequency control, Ttl integrated circuits.

For abstract, STAR 1317

PAT-APPL-589 119/GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Pasadena Office, Calif.
Charge-Coupled Device Data Processor for an Airborne Imaging Radar System.
Patent Application.
W. E. Arens. Filed 23 Jun 75, 38p NASA-CASE-NPO-13587-1
Contract NAS7-100
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Airborne equipment, *Central processing units, *Charge coupled devices, *Imaging techniques, *Radar imagery, Analog data, Equipment specifications, *Patent applications, Radar data.

The processing is described of raw analog echo data from a side-looking synthetic aperture radar receiver into images on board an airborne radar platform. The data were processed by using charge-coupled device (CCD) semiconductor technology; CCD circuits were utilized to perform input sampling, presumming, range correlation, and azimuth correlation in the analog domain. These radar data processing functions were implemented for single-look or multiple-look imaging radar.

17J. Seismic Detection

AD-A013 605/1GA PC$4.75/MF$2.25
Woods Hole Oceanographic Institution Mass
Collection and Analysis of Seismic Wide Angle Reflection and Refraction Data Using Radio Sonobuoys.
Technical rept.,
S. T. Knott, and Hartley Hoskins. Jul 75, 97p Rept no. WHOI-75-33
Contract N00014-74-C-0262, Grant NSF-GA-27516

Descriptors: *Seismometers, Sonobuoys, Seismic reflection, Wide angles, Seismographs, Refraction, Seismic data, Data acquisition, Seismic waves, Ocean bottom, Sediments, Thickness, Compressive properties, Oceanic crust, Ray tracing, Paths, Velocity, Instruction manuals, Underwater sound generators, Recording systems, Playback, Signal processing, Computer programs.
Identifiers: Primary waves, Oblique incidence, Seismic velocity.

Information and velocities of compressional waves and thicknesses of layers in the oceanic sediments and basement can be gathered by use of sonobuoys to receive repetitive sound sources (sparkers and airguns) over wide-angle or oblique sound paths. In order to obtain data of sufficient quality to ensure accurate and reproducible results by this method, it is essential that proper techniques be used in the original data acquisition, recording of ancillary data, and playback and analysis of the records. Detailed instructions are provided for field data collection, and for subsequent data playback and analysis, including suggestions for recording formats and scales. (Author)

AD-A013 668/9GA PC$4.75/MF$2.25
Rand Corp Santa Monica Calif
Soviet Strong-Motion and Vibration-and-Blast Seismographs.
Interim rept.,
Charles Shishkevish. Jul 75, 98p Rept no. R-1652-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1

Descriptors: *Seismographs, *Seismometers, USSR, Ground motion, Seismic detection, Blast, Vibration, Foreign technology, Literature surveys, State of the art, Galvanometers, Accelerometers, Seismic arrays, Networks, Instrumentation, Recording systems, Specifications.
Identifiers: Strong Motion Seismometers, Design.

This report contains a description of the current state of the art of Soviet strong-motion and vibration-and-blast seismographs, taken from Soviet publications available in the United States through early 1975. It is intended primarily for U.S. seismologists working with strong-motion data, and persons interested in Soviet advances in seismic instruments. The report contains: (1) four tables listing the technical specifications of Soviet seismometers and accelerometers used most widely in galvanometrically recording strong-motion seismographs; (2) a description of recorders; characteristics of four of the most widely used strong-motion instruments; and specifications of direct-recording, three-component seismograph systems. Also treated are auxiliary equipment, including seismic triggers, and seismic engineering networks. An extensive bibliography is included.

AD-A013 966/7GA PC$10.00/MF$2.25
Texas Instruments Inc Dallas Equipment Group
VELA Network Evaluation and Automatic Processing Research.
Final rept.,
David G. Lambert, Alexandra I. Tolstoy, and Ervin S. Becker. 9 Dec 74, 358p Rept nos. TI-ALEX(01)-TR-74-07, TR-7
Contract F08606-74-C-0033, ARPA Order-2551
Report on Project 'Seismic Detection and Discrimination Capabilities of the Very Long Period Experiment'. See also report dated 15 Nov 74, AD-A003 676.

Descriptors: *Seismic detection, *Underground explosions, Seismological stations, Nuclear explosions, Seismic arrays, Earthquakes, Seismometers, Data processing, Seismic data, Signal to noise ratio, Discrimination, Signal processing, Europe, Asia.
Identifiers: Vela Uniform, *Seismic discrimination, Alaskan long period array, Norwegian seismic array, Long period seismometers.

The report presents the final results of the continued evaluation of the capability of the single Very Long Period Experimental (VLPE) station, the VLPE network, and the VLPE-ALPA NORSAR combined network to detect and discriminate between presumed underground explosions and shallow earthquakes located in Eurasia. Presented is a summary of the important results pertaining to the studies of long-period earth noise, and the application of matched filters and the Three-Component Adaptive processor to VLPE data. The evaluation was conducted by Texas Instruments Incorporated at the Seismic Data Analysis Center over the period 1 November 1973 to 30 November 1974.

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

BDX-613-1325 PC$4.00/MF$2.25
Bendix Corp., Kansas City, Mo.
Sorting and Handling Laser Targets.
J. H. Kuehnle. May 75, 19p
Contract AT(29-1)-613

Descriptors: (*Thermonuclear fuels, *Separation processes), (*Microspheres, Separation processes), Lasers, Targets.

For abstract, see NSA 32 03, number 06177.

BNL-19850 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Use of Li(D,N) Neutrons for Simulation of Radiation Effects in Fusion Reactors.
A. N. Goland, C. L. Snead, Jr, D. M. Parkin, and R. B. Theus. 1975, 5p CONF-750335-27

Descriptors: (*Thermonuclear reactor materials, *Physical radiation effects), (*Neutron sources, *Uses), Deuteron beams, Lithium, Simulation.

For abstract, see NSA 32 03, number 06178.

BNWL-tr-140 PC$7.50/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Aspects of Energy Supply Fusion Reactors.
R. Buende, W. Daenner, W. Hofer, M. Huels, and R. Poehlchen. 25 Apr 75, 87p
Translation of IPP-VI--1.

Descriptors: (*Thermonuclear reactors, *Environmental effects), After-heat, Cost, Deuterium, Fuel systems, Lithium, Radioactivity, Reviews, Safety.

For abstract, see NSA 32 03, number 06179.

CLM-R-141 PC$4.00/MF$2.25
UKAEA Research Group, Abingdon. Culham Lab.
Time Constant for Magnetic Field Diffusion into a Hollow Cylindrical Conductor.
K. Khalaf-Allah. Nov 74, 11p
U.S. Sales Only.

Descriptors: (*Tokamak devices, Magnetic fields), (*Magnetic fields, *Diffusion), Configuration, Electric cables, Shells.

For abstract, see NSA 32 03, number 06180.

CONF-750606-2 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Computation of Transport and Neutral Beam Injection in Tokamaks.
J. T. Hogan, H. C. Howe, and R. H. Fowler. 1974, 4p

Descriptors: (*Tokamak devices, Neutral atom beam injection), (*Neutral atom beam injection, *Mathematical models), (*Plasma simulation, *Transport theory), Fokker-planck equation, Kinetic equations, One-dimensional calculations.

For abstract, see NSA 32 03, number 06181.

CONF-750607-11 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Heat Transfer Analysis of a First Wall Radiation Shield for a Fusion Reactor.
J. Patten, and T. Coultas. 28p

Descriptors: (*Thermonuclear reactor walls, *Heat transfer), Beryllium, Computer calculations, Graphite, Physical radiation effects, Shielding, Stainless steels.

For abstract, see NSA 32 03, number 06182.

COO-2218-28 PC$4.00/MF$2.25
Illinois Univ., Urbana.
Reactivities for Two-Component Fusion Calculations.
G. H. Miley, and H. H. Towner. 1975, 6p CONF-750303-51

Descriptors: (*Thermonuclear reactions, *Cross sections), Boron 11, Deuterium, Helium 3, Proton beams, Thermonuclear fuels, Tritium.

For abstract, see NSA 32 03, number 06183.

COO-2218-32 PC$4.00/MF$2.25
Illinois Univ., Urbana.
Effect of Radiation Losses on Fusion Energy Balances.
G. H. Miley, and T. C. Chu. 1974, 5p CONF-750607-5

Descriptors: (*Thermonuclear reactors, *Cyclotron radiation), Energy balance, Energy losses, Thermonuclear fuels, Thermonuclear reactions.

For abstract, see NSA 32 03, number 06184.

COO-2218-33 PC$4.00/MF$2.25
Illinois Univ., Urbana.
Plasma Requirements for Fusion--Fission Hybrids.
G. H. Miley. 1974, 5p CONF-750607-6

Descriptors: (*Thermonuclear reactors, *Hybrid systems), Efficiency, Fission, Numerical solution, Plasma.

For abstract, see NSA 32 03, number 06185.

ERDA-tr-17 PC$14.00/MF$2.25
Systems Analysis and Design of Thermonuclear Stations. Papers Delivered at a Joint USSR--Usa Seminar, 9--20 December 1974.
1974, 218p CONF-741238-
Translation of Sistemnyy analiz i konstruktsii termoyadernykh stantsiy, NIIEFA, Leningrad, 1974.

Descriptors: (*Thermonuclear reactors, *Meetings), Design.

For abstract, see NSA 32 03, number 06186.

LA-UR-75-14 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Optical Quality Study of the L.a.S.L. Co sub 2 Laser Amplifier System.
J. C. Goldstein. 5p CONF-750520-1
Contract W-7405-ENG-36

Descriptors: (*Carbon dioxide lasers, *Optical systems), Amplifiers, Performance.

For abstract, see NSA 32 03, number 06202.

LA-UR-75-511 PC$4.50/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Vapor Phase Coatings of Metals and Organics for Laser Fusion Target Applications.
G. A. Simonsic, and B. W. Powell. 29p CONF-750434-3
Contract W-7405-ENG-36

Descriptors: (*Thermonuclear fuels, *Coatings), (*Microspheres, Coatings), Chemical vapor deposition, Glow discharges, Thickness, Vapor deposited coatings, Vapors.

For abstract, see NSA 32 03, number 06203.

LA-UR-75-554 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Energy Storage, Compression, and Switching in a theta-Pinch Fusion Test Reactor.
K. I. Thomassen. 1974, 8p CONF-741163-1
Contract W-7405-eng-36

Descriptors: (*Scyllac devices, *Energy storage), Magnetic compression, Power supplies, Superconducting magnets, Switching circuits.

For abstract, see NSA 32 03, number 06204.

LA-5336(Vol.2) PC$5.45/MF$2.25
Nucleo de Estudos e Pesquisas Cientificas do Rio de Janeiro (Brazil).
Engineering Design Study of a Reference theta-Pinch Reactor (Rtpr): Environmental Impact Study.
J. E. Draley, R. A. Krakowski, T. A. Coultas, and V. A. Maroni. Mar 75, 73p ANL-8019
Contract W-7405-ENG-36

Descriptors: (*Toroidal theta pinch devices, *Environmental effects), Accidents, Beryllium, Design, Engineering, Niobium, Radiation hazards, Radioactivity, Thermonuclear reactor materials, Tritium.

For abstract, see NSA 32 03, number 06200.

LA-tr-75-3 PC$4.00/MF$2.25
AN SSSR, Novosibirsk. Inst. Yadernoj Fiziki.
Possibility of Building a Thermonuclear Reactor with a Dense Plasma Contained by a Crimped Magnetic Field.
G. I. Budker, E. P. Kruglyakov, V. V. Mirnov, and D. D. Ryutov. Jan 75, 18p CONF-741238-1
Translation by H.J. Dahlby of O vozmoshnosti sozdaniia termoiadernogo reaktora c plotnoi underzhivaemoi gofritovannym magnitnym polem.

Descriptors: (*Thermonuclear devices, *Magnetic field configurations), Magnetic mirrors, Planning, Plasma confinement, Plasma density, Specifications.

For abstract, see NSA 32 03, number 06201.

MATT-1118 PC$4.50/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Empirical Scaling for Present Ohmic Heated Tokamaks.
C. Daughney. Jun 75, 28p
Contract AT(11-1)-3073

Descriptors: (*Tokamak devices, *Joule heating), Electric currents, Electron temperature, Magnetic fields, Scaling laws.

For abstract, see NSA 32 03, number 06205.

ORNL-TM-4920 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Beam Focusing by Aperture Displacement in Multiampere Ion Sources.
L. D. Stewart, J. Kim, and S. Matsuda. May 75, 19p
Contract W-7405-eng-26

Descriptors: (*Ormak devices, Penning ion sources), (*Penning ion sources, *Focusing), Apertures, Beam optics, Duoplasmatrons, Neutral atom beam injection.

For abstract, see NSA 32 03, number 06207.

ORO-4513-2 PC$4.00/MF$2.25
Maryland Univ., College Park.

Theory of High Temperature Plasmas. (Progress Report).
R. C. Davidson. 1975, 12p
Contract AT(40-1)-4513

Descriptors: (*High-beta plasma, *Reviews), (*Toroidal screw pinch devices, Reviews), Bibliographies, Kinetic equations, Plasma, Transport theory.

For abstract, see NSA 32 03, number 06208.

SAND-75-5122 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Vacuum Pumping Considerations for Electron Beam Fusion Reactors.
T. O. Hunter. 1975, 5p CONF-750624-3

Descriptors: (*Thermonuclear reactors, *Vacuum systems), Electron beams, Electron sources, Performance, Plasma production.

For abstract, see NSA 32 03, number 06209.

UCID-16736 PC$6.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Committee Report: LII Re-Evaluation of the Simple Mirror for a Fusion Reactor.
R. W. Moir, D. E. Baldwin, G. A. Carlson, T. K. Fowler, and B. G. Logan. 18 Apr 75, 65p
Contract W-7405-eng-48

Descriptors: (*Magnetic mirrors, *Performance), Cold plasma, Feedback, Flute instability, Stabilization.

For abstract, see NSA 32 03, number 06210.

UCID-16800 PC$4.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Scaling of a Truss Support Structure for Yin Yang Coils.
C. J. Schwer. 20 May 75, 21p
Contract W-7405-eng-48

Descriptors: (*Magnet coils, *Supports), Baseball devices, Construction, Cost, Magnetic mirrors, Mechanical structures, Performance.

For abstract, see NSA 32 03, number 06211.

UCRL-51778 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Remote Operations in a Fusion Engineering Research Facility (Ferf).
J. N. Doggett. 14 Mar 75, 20p
Contract W-7405-Eng-48

Descriptors: (*Thermonuclear devices, *Remote handling), (*Thermonuclear reactor walls, *Materials testing), Control systems, Magnet coils, Physical radiation effects.

For abstract, see NSA 32 03, number 06212.

UCRL-74626 PC$6.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Pulse Characterization for the Long Path Laser at LII.
L. W. Coleman, J. E. Swain, F. Rainer, and R. A. Saroyan. 2 Apr 73, 57p

Descriptors: (*Neodymium lasers, *Energy spectra), Design, Modulation, Optical systems, Performance.

For abstract, see NSA 32 03, number 06213.

UCRL-76702 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Optical Pulse Compression.
A. J. Glass. 16 Apr 75, 7p CONF-741113-13

Descriptors: (*Lasers, *Optical systems), (*Laser radiation, *Compression), Laser implosions, Pulses.

For abstract, see NSA 32 03, number 06214.

18B. Isotopes

BNWL-tr-144 PC$4.00/MF$2.25
Power Reactor and Nuclear Fuel Development Corp., Tokyo (Japan).
Centrifuge for Separation of Enriched exp 235 U.
Y. Ohyama, Y. Takashima, and N. Aoki. 30 Apr 75, 12p
Translation of Japanese Patent 1973-11278.

Descriptors: (*Uranium 235, *Isotope separation), (*Gas centrifuges, *Design).

For abstract, see NSA 32 03, number 06593.

CEA-R-4663 PC$4.50/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Div. de Chimie.
Theoretical Notions in Isotope Separation.
R. Jacques. Jun 75, 27p
In French. U.S. Sales Only.

Descriptors: (*Uranium 235, *Isotope separation), Efficiency, Optimization.

For abstract, see NSA 32 03, number 06594.

CONF-750317- PC$5.45/MF$2.25
Atomic Industrial Forum, Inc., New York.
Alf Fuel Cycle Conference '75, Atlanta, Georgia, March 18--21, 1975. Remarks Presented by Erda and Ucc Representatives.
1975, 80p

Descriptors: (*Fuel cycle, *Meetings), Enriched uranium, Gaseous diffusion plants, Leading abstract, Uranium.

For abstract, see NSA 32 03, number 06595.

LA-UR-75-842 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Laser Isotope Separation.
C. P. Robinson. 20p CONF-750460-2
Contract W-7405-eng-36

Descriptors: (*Uranium 235, *Isotope separation), (*Laser isotope separation, *Reviews), Kinetics.

For abstract, see NSA 32 03, number 06598.

PB-243 636/8GA PC$3.75/MF$2.25
National Environmental Research Center, Las Vegas, Nev. Technical Support Lab.
Environmental Radioactivity Laboratory Intercomparison Studies Program, 1975.
Environmental monitoring series.
May 75, 27p EPA/680/4-75/002b
See also PB-240 962.

Descriptors: *Radioactive isotopes, *Standards, Quantitative analysis, Quality control, Calibrating, Laboratory tests, Chemical analysis, Air pollution, Water pollution, Sampling, Questionnaires, Statistical analysis, Comparison.
Identifiers: Air pollution sampling, Water pollution sampling.

The U.S. Environmental Protection Agency's intercomparison studies program for laboratories involved in environmental radiation measurements is described. The types of environmental samples distributed, the analysis required for each sample, the distribution schedule, and the statistical analysis and reporting of results are discussed. Instructions and application forms are included for laboratories desiring to participate in the program. This document is not a research report. It is designed for use by laboratories participating or desiring to participate in this quality assurance program.

UCRL-51796 PC$5.45/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Isotope Separation by Laser Deflection of an Atomic Beam.
A. F. Bernhardt. Feb 75, 108p
Contract W-7405-eng-48

Descriptors: (*Barium isotopes, *Isotope separation), Atomic beams, Laser isotope separation.

For abstract, see NSA 32 03, number 06599.

UCRL-76540 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Isotope Separation Using Tunable Lasers.
B. B. Snavely. 15 Apr 75, 14p CONF-750621-1

Descriptors: (*Uranium 235, *Isotope separation), (*Laser isotope separation, *Reviews), Photochemistry.

For abstract, see NSA 32 03, number 06600.

UCRL-76601 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Laser Isotope Separation of Uranium.
A. Hartford. 15 Apr 75, 23p CONF-750627-1

Descriptors: (*Uranium 235, *Isotope separation), Laser isotope separation.

For abstract, see NSA 32 03, number 06601.

18C. Nuclear Explosions

AD-A013 972/5GA PC$3.75/MF$2.25
Air Force Weapons Lab Kirtland AFB N Mex
HAPS - A Two-Dimensional High Altitude EMP Environment Code.
Theoretical note,
W. A. Radasky, and R. L. Knight. Nov 71, 36p
Rept no. AFWL-EMP-Theoretical note-125

Descriptors: *Electromagnetic pulses, *Computer programming, *Nuclear explosions, Finite difference theory, Maxwells equations, Partial differential equations, Airburst.
Identifiers: *HAPS computer code.

This report discusses the mathematical formulation of the field calculations and boundary conditions used in HAPS, the AFWL high-altitude EMP environment code. The finite difference scheme employed in the solution of these equations is also described. A final section exhibits some results of comparisons that have been made between HAPS and other environmental codes.

BM-IC-8425 PC$5.00/MF$2.25
Bureau of Mines, Denver, Colo. Denver Mining Research Center.
Potential Applications for Nuclear Explosives in a Shale-Oil Industry.
F. E. Williams, P. L. Russell, and M. J. Sheridan. 1969, 37p

Descriptors: (*Nuclear explosions, *Uses), (*Shale oil, *In-situ processing), Economics, Geology, Mining, Oil shale industry, Oil shales, Safety, Underground explosions, Usa.

For abstract, see NSA 32 03, number 06359.

Group 18C—Nuclear Explosions

COO-1156-76 PC$4.25/MF$2.25
Colorado State Univ., Fort Collins Dept. of Radiology and Radiation Biology.
Environmental Impacts Associated with Project Rio Blanco.
A. W. Alldredge, F. W. Whicker, and W. C. Hanson. 24p

Descriptors: (*Natural gas, *Explosive stimulation), (*Rio blanco event, *Environmental effects), Animals, Birds, Colorado, Contamination, Ground motion, Radiation hazards, Radioactivity, Safety, Seismic effects.

For abstract, see NSA 32 03, number 06360.

UCID-16662 PC$5.25/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Transient Gas Flow Through Layered Porous Media.
F. A. Morrison, Jr. 16 Jan 75, 44p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosives, *Emplacement), (*Gas flow, *Analytical solution), (*Computer codes, *S codes), Contained explosions, Geologic deposits, Mathematical models, Nuclear explosions, Permeability, Porosity, Solids.

For abstract, see NSA 32 03, number 06362.

UCID-16781 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Feasibility of Observation of Cavity Growth by Em Scattering.
L. F. Wouters. 1 Apr 69, 18p
Contract W-7405-Eng-48

Descriptors: (*Nuclear explosions, Cavities), (*Cavities, *Diagnostic techniques), Electromagnetic radiation, Fission yield, Growth, Measuring methods, Underground explosions.

For abstract, see NSA 32 03, number 06363.

UCID-16782 PC$5.45/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Feasibility of Observation of Cavity Growth by Em Scattering (Appendix).
L. F. Wouters. 1 Apr 68, 130p
Contract W-7405-Eng-48

Descriptors: (*Nuclear explosions, Cavities), (*Cavities, *Diagnostic techniques), Electromagnetic radiation, Fission yield, Growth, Measuring methods, Underground explosions.

For abstract, see NSA 32 03, number 06364.

UCRL-76280(Rev.1) PC$4.75/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Project Rio Blanco: Project Scientist'S Summary Report of Production Test Data and Preliminary Analysis of Top Chimney/Cavity.
J. Toman. Mar 75, 34p CONF-750109-9

Descriptors: (*Rio blanco event, *Testing), (*Natural gas, *Explosive stimulation), Radioactivity.

For abstract, see NSA 32 03, number 06365.

18D. Nuclear Instrumentation

AEEW-R-936 PC$5.50/MF$2.25
UKAEA Reactor Group, Winfrith. Atomic Energy Establishment.
Calibration of Fission Chambers for Fast Reactor Experiments.
D. W. Sweet. Aug 74, 47p
U.S. Sales Only.

Descriptors: (*Fission chambers, *Calibration), (*Zebra reactor, *Reactor experimental facilities), Fission foil detectors, Performance.

For abstract, see NSA 32 03, number 06479.

AERE-R-7299 PC$4.00/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Camac Shaft Positioning System.
G. R. Wallace-Sims. Jan 75, 17p
U.S. Sales Only.

Descriptors: (*Neutron diffractometers, *Control systems), (*Shielding, *Orientation), Alignment, Camac system.

For abstract, see NSA 32 03, number 06576.

AERE-R-7887 PC$5.00/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Assessment of Energy as Well as Radiation Dose from a Multi-Element Film Dosemeter.
J. W. Smith. Jan 75, 37p
U.S. Sales Only.

Descriptors: (*Photographic film dosemeters, *Data processing), Comparative evaluations, Computer codes, Personnel dosimetry.

For abstract, see NSA 32 03, number 06513.

ANL/NDM-12 PC$5.50/MF$2.25
Argonne National Lab., Ill.
Spectrometer for the Investigation of gamma Radiation Produced by Neutron-Induced Reactions.
D. L. Smith. Apr 75, 49p
Contract W-31-109-Eng-38

Descriptors: (*Gamma spectrometers, *Li-drifted ge detectors), Accelerator facilities, Calibration, Cross sections, Data acquisition systems, Data processing, Dynamitrons, Excitation functions, Fission chambers, Neutron fluence, Neutron reactions, Performance, Plastic scintillation detectors.

For abstract, see NSA 32 03, number 06535.

BNL-19232 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
On-Line Satellite/Central Computer Facility of the Multiparticle Argo Spectrometer System.
E. W. Anderson, G. P. Fisher, N. C. Hien, G. P. Larson, and A. M. Thorndike. Sep 74, 18p
CONF-730470-3

Descriptors: (*Multiparticle spectrometers, *Data acquisition systems), (*Brookhaven ags, *Accelerator facilities), Cdc computers, Magnetic spectrometers, On-line systems, Pdp computers, Proton-proton interactions, Wire spark chambers.

For abstract, see NSA 32 03, number 06549.

BNL-19674 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Printed Low Velocity Delay Lines for Cathode Readout of Proportional Chambers.
R. Bosshard, R. L. Chase, J. Fischer, and V. Radeka. 1974, 6p CONF-750521-1

Descriptors: (*Multiwire proportional chambers, *Readout systems), Dead time, Delay circuits, Design, Performance, Position sensitive detectors.

For abstract, see NSA 32 03, number 06550.

BNWL-B-127 PC$4.75/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Hanford Multipurpose TL Dosimeter Field Tests and Evaluation.
L. L. Nichols, G. W. R. Endres, D. B. Shipler, E. E. Oscarson, and L. L. Crass. Aug 72, 31p
Contract AT(45-1)-1830

Descriptors: (*Thermoluminescent dosemeters, *Performance testing), Calibration, Hapo, Nuclear facilities, Personnel monitoring.

For abstract, see NSA 32 03, number 06514.

CEA-N-1753 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Service de Protection et des Etudes d'Environnement.
Dosimetry in Neutrotherapy: Ionization Chambers Performance.
Y. Herbaut, P. Bory, R. Vivia, and S. Marcie. Oct 74, 15p
In French. U.S. Sales Only.

Descriptors: (*Neutron dosimetry, Ionization chambers), (*Ionization chambers, *Performance), (*Radiotherapy, Neutron dosimetry), Ethylene, Neutron beams.

For abstract, see NSA 32 03, number 06515.

DP-MS-75-49 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Response of Savannah River Thermoluminescent Neutron Dosimeter to Monoenergetic Neutrons.
J. E. Hoy, and R. M. Hall. 1975, 12p CONF-750528-2
Contract AT(07-2)-1

Descriptors: (*Neutron dosimetry, Thermoluminescent dosemeters), (*Thermoluminescent dosemeters, *Senaitivity), (*Albedo-neutron dosemeters, Sensitivity), Cold neutrons, Kev range 01-10, Kev range 10-100, Personnel dosimetry.

For abstract, see NSA 32 03, number 06516.

IS-M-30 PC$4.25/MF$2.25
Argonne National Lab., Ill.
Nal 30-Inch Bubble Chamber-Wide GAP Spark Chamber Hybrid System.
E. W. Anderson, H. B. Crawley, W. J. Kernan, and F. Ogino. 24p CONF-740713-39

Descriptors: (*Bubble chambers, *Operation), (*Wide gap spark chambers, Operation), Accelerator facilities, Data processing, Gamma detection, Hybrid systems, Nal synchrotron, Programming.

For abstract, see NSA 32 03, number 06552.

JINR-P11-8633 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Controller in the Camac System for Two-Dimensional Spectrometer Measurements and for Connection with Memory 4K.
G. N. Zimin, and V. V. Pavlenko. 1975, 6p
In Russian. U.S. Sales Only.

Descriptors: (*Spectrometers, *Data acquisition systems), Camac system, Control systems, Logic circuits.

For abstract, see NSA 32 03, number 06538.

JINR-P13-8668 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
System of Magnetostrictive Spark Chambers in the Experimental Installation 'Photon'.
Yu. V. Zanevskii, A. B. Ivanov, and I. M. Ivanchenko. 1975, 27p
In Russian. U.S. Sales Only.

Descriptors: (*Wire spark chambers, *Design), Computers, Magnetostriction, On-line measurement systems, Operation, Readout systems.

For abstract, see NSA 32 03, number 06553.

NRPB-R-30 PC$4.25/MF$2.25
National Radiological Protection Board, Harwell (UK).
Evaluation of the Fission Track Method as a Personal Neutron Dosemeter.
T. V. Bird, and B. L. Davies. Sep 74, 23p
U.S. Sales Only.

Descriptors: (*Dielectric track detectors, *Performance), (*Neutron dosimetry, Dielectric track detectors), Comparative evaluations, Cost, Dosemeters, Fast neutrons, Fission tracks, Fissionable materials, Personnel dosimetry, Personnel monitoring, Radiation hazards, Radioactivity, Readout systems.

For abstract, see NSA 32 03, number 06519.

ORO-4814-1 PC$4.25/MF$2.25
Georgia Inst. of Tech., Atlanta.
Development and Application of Some Fast Neutron Dosimetry Techniques Utilizing Plastic Track Detectors for Therapeutic and Health Physics Related Applications. Progress Report.
K. Z. Morgan, and M. Sohrabi. 19 May 75, 26p
Contract AT(40-1)-4814

Descriptors: (*Neutron dosimetry, Dielectric track detectors), (*Dielectric track detectors, *Research programs), Fast neutrons, Plastics.

For abstract, see NSA 32 03, number 06520.

RD/B/N-3222 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Low Background beta Spectrometer; Design and Preliminary Results.
J. F. B. Payne. Oct 74, 16p
U.S. Sales Only.

Descriptors: (*Beta spectrometers, *Design), (*Beta sources, *Radiometric analysis), Background noise, Beta detection, Low level counters, Scintillation counters, Semiconductor detectors, Sensitivity, Strontium 90.

For abstract, see NSA 32 03, number 06540.

RL-75-015 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
12 Ft Argonne Bubble Chamber Tst Project. First Operational Test (Guidelines).
E. W. Fitzharris. Jan 75, 14p
U.S. Sales Only.

Descriptors: (*Bubble chambers, *Performance testing), Anl, Gas track detectors, Hydrogen, Mixtures, Neon, Nimrod, Operation, Target chambers, Targets, Testing.

For abstract, see NSA 32 03, number 06554.

UCSD-34P220X1 PC$4.25/MF$2.25
California Univ., San Diego, La Jolla Dept. of Radiology.
Role of Secondary Particles in the Ionization Process. Progress Report, April 1--December 31, 1974.
N. A. Baily. 25p
Contract AT(04-3)-34

Descriptors: (*Multiwire proportional chambers, *Ionization), (*Alpha particles, *Energy losses), (*Methane, *Charged-particle transport), (*Nitrogen, Charged-particle transport), Alpha detection, Americium 241, Carbon dioxide, Flow counters, Performance, Preamplifiers, Specifications.

For abstract, see NSA 32 03, number 07876.

18E. Nuclear Power Plants

AAEC/E-343 PC$4.00/MF$2.25
Australian Atomic Energy Commission Research Establishment, Lucas Heights.
Comparison of Calculations of a Reflected Reactor with Diffusion, SN and Monte Carlo Codes.
B. McGregor. Jan 75, 13p
U.S. Sales Only.

Descriptors: (*Moata reactor, *Multiplication factors), A codes, Carlson method, Comparative evaluations, K codes, Mockup, Monte carlo method, Neutron diffusion equation, Neutron transport, P codes, Reactor lattices.

For abstract, see NSA 32 03, number 08087.

AERE-R-7890 PC$4.00/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Diffusion of Caesium in the Outer Pyrolytic Carbon Layer of Unirradiated Coated Fuel Particles.
E. W. Hooper. Feb 75, 19p
U.S. Sales Only.

Descriptors: (*Htgr type reactors, Coated fuel particles), (*Coated fuel particles, *Fission product release), (*Cesium, *Diffusion), (*Pyrolytic carbon, *Permeability), Chemical composition, Coatings, Distribution, Fission products, Quantity ratio.

For abstract, see NSA 32 03, number 08039.

ANL-Trans-979 PC$8.50/MF$2.25
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
Metallurgical and Thermodynamic Study of a Carbide Fuel Containing Inactive Fission Products: Irradiated Nuclear Fuel 'Simulation'.
N. Lorenzelli. Apr 75, 106p
Translation of CEA-R--4465.

Descriptors: (*Lmfbr type reactors, Nuclear fuels), (*Nuclear fuels, *Metallurgy), (*Uranium carbides, Metallurgy), Chemical composition, Fission products, Physical radiation effects, Simulation.

For abstract, see NSA 32 03, number 08059.

ANL-8131 PC$5.45/MF$2.25
Argonne National Lab., Ill.
Cobra-3M: A Digital Computer Code for Analyzing Thermal-Hydraulic Behavior in Pin Bundles.
W. W. Marr. Mar 75, 54p
Contract W-31-109-Eng-38

Descriptors: C codes, Computer codes, Configuration, Fuel assemblies, Fuel channels, Fuel pins, Heat transfer, Hydraulics, Liquid flow, Lmfbr type reactors.

For abstract, see NSA 32 03, number 08057.

BNWL-SA-5285 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Study of Hanford as a Nuclear Energy Center.
H. Harty. 24 Feb 75, 9p CONF-750227-1
Contract AT(45-1)-1830

Descriptors: (*Nuclear power plants, *Site selection), (*Energy transport, *Cost), (*Nuclear parks, *Planning), Earthquakes, Hazards, Thermal effluents.

For abstract, see NSA 32 03, number 08380.

CEA-N-1725 PC$10.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Div. d'Etude et de Developpement des Reacteurs.
Development of Methods for Calculating the Poisons Burnable in Natural Water Reactors.
J. Mondot. Jul 74, 139p
In French. U.S. Sales Only.

Descriptors: (*Pwr type reactors, *Burnable poisons), Reactivity worths, Reactor kinetics.

For abstract, see NSA 32 03, number 08029.

CEA-N-1779 PC$4.50/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Div. d'Etude et de Developpement des Reacteurs.
200 Group Doppler Effect Calculation for the Ermine Experiment.
A. Banifatemi, A. Guyader, and A. Kavenoky. Jan 75, 28p
In French. U.S. Sales Only.

Descriptors: (*Ermine reactor, *Doppler coefficient), Computer calculations, Multigroup theory, Perturbation theory, Pile oscillation techniques, Self-shielding.

For abstract, see NSA 32 03, number 08088.

CONF-750604-1 PC$4.50/MF$2.25
Argonne National Lab., Ill.
Use of Ebr-II as a Principal Fast Breeder Reactor Irradiation Test Facility in the U.S.
R. G. Staker, O. S. Seim, W. N. Beck, G. H. Golden, and L. C. Walters. 1975, 28p
Contract W-31-109-Eng-38

Descriptors: (*Ebr-2 reactor, *Reactor operation), Irradiation capsules, Modifications, Reactor cores, Reactor experimental facilities, Reactor materials.

For abstract, see NSA 32 03, number 08090.

COO-2250-3 PC$12.50/MF$2.25
Massachusetts Inst. of Tech., Cambridge Dept. of Nuclear Engineering.
Lmfbr Blanket Physics Project Progress Report No. 4.
M. J. Driscoll, D. D. Lanning, I. Kaplan, and A. T. Supple. 30 Jun 73, 190p MITNE-149
Contract AT(11-1)-2250

Descriptors: (*Lmfbr type reactors, Breeding blankets), (*Breeding blankets, *Research programs), Gamma radiation, Mockup, Neutron reflectors, Radiation heating.

For abstract, see NSA 32 03, number 08061.

DLCS-5000374 PC$4.00/MF$2.25
Duquesne Light Co., Shippingport, Pa.
Shippingport Atomic Power Station. Quarterly Operating Report, Third Quarter 1974.
1974, 14p
Contract AT(11-1)-292

Descriptors: (*Shippingport reactor, *Reactor maintenance), Reactor operation, Repair, Solid wastes, Turbines.

No abstract available.

DOCKET-STN-50535-1 PC$31.25/MF$2.25
General Atomic Co., San Diego, Calif.

Gasear-8 (General Atomic Standard Safety Analysis Report). Volume 1.
3 Feb 75, 565p GA-A-13200(V.1)

Descriptors: Control elements, Design, Electrical equipment, Fission product release, Floods, Fuel rods, Ga standard reactor, Helium, Mechanical structures, Pipelines, Reactor components, Reactor sites, Ruptures, Tornadoes, Wind.

For abstract, see NSA 32 03, number 08397.

DOCKET-50010-398 PC$15.75/MF$2.25
Commonwealth Edison Co., Chicago, Ill.
Dresden Nuclear Power Station, Units 1, 2, and 3. Semiannual Report on Operating and Maintenance, July--December 1974.
23 May 75, 253p DOCKET-50237-292, DOCKET-50249-623

Descriptors: (*Dresden-1 reactor, *Reactor operation), (*Dresden-2 reactor, Reactor operation), (*Dresden-3 reactor, Reactor operation), Power generation, Reactor maintenance, Reactor shutdown, Testing.

For abstract, see NSA 32 03, number 08393.

DOCKET-50250-364 PC$5.25/MF$2.25
Florida Power and Light Co.
Turkey Point Plant, Units 3 and 4. First Year Operating Report.
8 May 75, 41p DOCKET-50251-348

Descriptors: (*Turkey point-3 reactor, *Reactor operation), (*Turkey point-4 reactor, Reactor operation), Availability, Condensates, Containment, Cooling, Electric batteries, Failures, Fuel pools, Interlocks, Mechanical structures, Performance, Power generation, Radioactive waste disposal, Rhr systems, Spent fuel storage.

No abstract available.

DOCKET-50321-244 PC$6.50/MF$2.25
Georgia Power Co., Atlanta.
Edwin I. Hatch Nuclear Plant, Unit 1. Semiannual Operating Report, September 12--December 31, 1974.
1974, 68p

Descriptors: (*Hatch-1 reactor, *Reactor operation), Availability, Criticality, Efficiency, Electric power, Fission product release, Personnel, Power generation, Primary coolant circuits, Radiation doses, Radioactive waste disposal, Reactor maintenance, Reactor shutdown, Testing, Water chemistry.

For abstract, see NSA 32 03, number 08395.

EIR-276 PC$5.25/MF$2.25
Eidgenoessisches Inst. fuer Reaktorforschung, Wuerenlingen (Switzerland).
Breeding in Molten Salt Reactors. Lectures at the University of Liege/Belgium, 15TH May 1975.
M. Taube. Apr 75, 41p
U.S. Sales Only.

Descriptors: Breeder reactors, Breeding ratio, Lectures, Molten salt fuels, Molten salt reactors, Reviews.

For abstract, see NSA 32 03, number 08062.

ERDA-29-74 PC$5.45/MF$2.25
Energy Research and Development Administration, Washington, D.C. Div. of Reactor Research and Development.
Operating History of U.S. Nuclear Power Reactors.
1974, 89p

Descriptors: (*Nuclear power plants, *Availability), Diagrams, Electric power, Reactor operation, Tables, Usa.

For abstract, see NSA 32 03, number 08014.

EUR-5198e PC$4.75/MF$2.25
Commission of the European Communities, Luxembourg.
Lwr Fuel Irradiation Facilities in the Hfr Petten.
J. Markgraf, and P. Zeisser. Jul 74, 35p CONF-740742-2
U.S. Sales Only.

Descriptors: (*Hfr reactor, *Experimental channels), Configuration, In pile loops, Irradiation capsules, Performance, Reactor operation, Specifications.

For abstract, see NSA 32 03, number 08091.

EURFNR-1182 PC$7.60/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
Fast Breeder Project Status Report, 1974.
R. Hueper. May 74, 207p
Translation of KFK--2003.

Descriptors: (*Lmfbr type reactors, *Research programs), Euratom, European communities, Fuel pins, Knk reactor, Reactor materials, Reactor safety, Snr reactor.

For abstract, see NSA 32 03, number 08063.

EURFNR-1216 PC$7.60/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
Fast Breeder Project. Second Quarterly Report, 1974.
R. Hueper. Oct 74, 183p
Translation of KFK--1274/2.

Descriptors: (*Lmfbr type reactors, Fuel pins), (*Fuel pins, *Research programs), (*Reactor materials, Research programs), (*Reactor components, Research programs), Corrosion, Design, Environmental effects, Fuel cycle, Reactor instrumentation, Reactor kinetics, Reactor safety, Snr reactor.

For abstract, see NSA 32 03, number 08064.

FIND-STN-50508 PC$4.00/MF$2.25
Energy Research and Development Administration, Oak Ridge, Tenn. Technical Information Center.
Find: Wppss Nuclear Project No. 3 and No. 5.
W. H. Williams. May 75, 35p

Descriptors: (*Wnp-3 reactor, *Reactor licensing), (*Wnp-5 reactor, Reactor licensing), Indexes, Reactor safety, Us erda, Us nrc.

For abstract, see NSA 32 03, number 08399.

FIND-50206-R1 PC$4.00/MF$2.25
Energy Research and Development Administration, Oak Ridge, Tenn. Technical Information Center.
Find: San Onofre Nuclear Generating Station, Unit 1.
E. P. Carter. Mar 75, 42p

Descriptors: (*San onofre-1 reactor, *Reactor licensing), Indexes, Reactor safety.

For abstract, see NSA 32 03, number 08398.

GA-A-12728 PC$5.45/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Gas-Cooled Fast Breeder Reactor. Quarterly Progress Report, May 1, 1973--July 31, 1973.
10 Oct 73, 113p
Contract AT(04-3)-167

Descriptors: (*Gcfr reactor, Fuel elements), (*Fuel elements, *Deformation), (*Reactor cores, *Stress analysis), Breeding blankets, Fuel assemblies, Hot spots, Irradiation capsules, Research programs, Seals, Spacers, Stainless steel-316, Temperature distribution, Thermal stresses, Vents.

No abstract available.

GA-A-13101 PC$5.45/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Loading of Fuel and Reflector Elements in the Fort St. Vrain Initial Core (Results of Start-Up Test a-1).
A. C. Marshall, and J. R. Brown. 1 Nov 74, 85p
Contract AT(04-3)-633

Descriptors: (*Vrain reactor, *Reactor fueling), Comparative evaluations, Data, In core instruments, Multiplication factors.

For abstract, see NSA 32 03, number 08041.

GA-A-13102 PC$4.00/MF$2.25
General Atomic Co., San Diego, Calif.
Experiment Description and Safety Analysis for the F-3 Mixed-Oxide Fuel Rod Irradiation in Ebr-II.
P. W. Flynn, R. F. Hinz, S. Langer, and J. R. Lindgren. 30 Oct 74, 37p
Contract AT(04-3)-167

Descriptors: (*Gcfr type reactors, Fuel elements), (*Fuel elements, *Testing), Ebr-2 reactor, Plutonium dioxide, Stainless steel-316, Uranium dioxide.

For abstract, see NSA 32 03, number 08066.

GA-A-13156 PC$4.00/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Fort St. Vrain Hot Functional Test Results.
R. D. Phelps. 30 Dec 74, 30p
Contract AT(04-3)-633

Descriptors: (*Vrain reactor, *Primary coolant circuits), Pressure vessels, Reactor components, Reactor operation, Reactor start-up, Simulation, Stresses, Testing.

For abstract, see NSA 32 03, number 08042.

GA-A-13176 PC$5.45/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Neutron Flux Distribution Measurement in the Fort St. Vrain Initial Core (Results of Fort St. Vrain Start-Up Test a-7).
A. C. Marshall, and J. R. Brown. 28 Feb 75, 84p
Contract AT(04-3)-633

Descriptors: (*Vrain reactor, *Power distribution), Comparative evaluations, Data, Neutron flux, Spatial distribution.

For abstract, see NSA 32 03, number 08043.

GA-A-13187 PC$5.45/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Maintenance Plan for the Gas Turbine Htgr Power Plant.
J. A. Paget. 31 Oct 74, 66p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, *Reactor maintenance), Gas turbines, Inspection, Planning, Reactor components.

For abstract, see NSA 32 03, number 08044.

GA-A-13196 PC$5.45/MF$2.25
General Atomic Co., San Diego, Calif.

Approximate Closed Form Solution to the Fission Product Diffusion Equation in One-Dimensional Slab Geometry.
P. D. Smith. 1 Nov 74, 70p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, Fission products), (*Fission products, *Diffusion), Analytical solution, Boundary conditions, Graphite, Mathematical models, Reactor cores, T codes.

For abstract, see NSA 32 03, number 08045.

GA-A-13213 PC$4.00/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Fission Product Plateout Calculations for a Gas Turbine Htgr.
R. D. Chmielewski, and C. G. Hoot. 1 Nov 74, 39p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, Direct cycle cooling systems), (*Direct cycle cooling systems, *Surface contamination), (*Fission products, *Deposition), (*Cesium 137, *Adsorption), Activity levels, Desorption, Gas turbines, Iodine 131, Lanthanum 140, Radionuclide migration, Reactor cooling systems, Silver 110, Strontium 90, Tellurium.

For abstract, see NSA 32 03, number 08046.

GA-A-13253 PC$7.60/MF$2.25
General Atomic Co., San Diego, Calif.
Htgr Fuels and Core Development Program. Quarterly Progress Report for the Period Ending November 30, 1974.
31 Jan 75, 159p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, Fuel elements), (*Fuel elements, *Performance testing), (*Graphite, *Physical radiation effects), (*Uranium carbides, Physical radiation effects), Coated fuel particles, Diffusion, Fission product release, Hydrolysis, Research programs, Tensile properties, Thorium carbides, Thorium oxides, Uranium dioxide.

No abstract available.

GA-A-13285 PC$4.00/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Public Service Company of Colorado 330-Mw(E) High-Temperature Gas-Cooled Reactor Research and Development Program. Quarterly Progress Report for the Period Ending December 31, 1974.
31 Jan 75, 24p
Contract AT(04-3)-633

Descriptors: (*Vrain reactor, *Control rod worths), Reactivity, Reactor fueling, Reactor period, Research programs, Temperature coefficient.

No abstract available.

GA-A-13353 PC$5.45/MF$2.25
General Atomic Co., San Diego, Calif.
Htgr Fuels and Core Development Program. Quarterly Progress Report for the Period Ending February 28, 1975.
31 Mar 75, 112p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, *Fuel elements), (*Graphite, *Physical radiation effects), (*Uranium carbides, Physical radiation effects), (*Thorium oxides, Physical radiation effects), Coated fuel particles, Diffusion, Fission product release, Fission products, Hydrolysis, Performance testing, Radionuclide kinetics, Research programs, Tensile properties, Thorium carbides, Uranium dioxide.

No abstract available.

GA-A-13379 PC$7.60/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Gas-Cooled Fast Breeder Reactor. Quarterly Progress Report for the Period November 1, 1974--January 31, 1975.
20 Mar 75, 206p
Contract AT(04-3)-167

Descriptors: (*Gcfr reactor, *Fuel element failure), (*Fuel elements, *Vents), (*Reactor cores, *Stress analysis), (*In pile loops, *Planning), Adhesion, Breeding blankets, Configuration, Containers, Deformation, Design, Fission products, Friction, Fuel-cladding interactions, Gas flow, Heat transfer, Helium, Irradiation capsules, Leak testing, Melting, Neutron flux, Physical radiation effects, Porosity, Pressure gradients, Prestressed concrete, Primary coolant circuits, Radiation heating, Radiation monitoring, Reactor safety, Removal, Research programs, Seals, Shielding, Shields, Spacers, Stainless steel-316, Thermal insulation, Thermal stresses.

No abstract available.

HEDL-TME-73-75 PC$5.45/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
Heavy Section Steel Technology Program. Technical Report No. 31. The Irradiation and Temperature Dependence of Tensile and Fracture Properties of Astm A533, Grade B, Class 1 Steel Plate and Weldment.
J. A. Williams. Aug 73, 56p
Contract AT(45-1)-2170

Descriptors: (*Pwr type reactors, Pressure vessels), (*Bwr type reactors, Pressure vessels), (*Pressure vessels, *Research programs), (*Steel-astm-a533, *Fracture properties), Annealing, Physical radiation effects, Reactor materials, Tensile properties.

For abstract, see NSA 32 03, number 08019.

IAE-2345 PC$5.00/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Moscow. Inst. Atomnoj Ehnergii.
Investigations of the Thermohydraulic Characteristics of Models of Reactor Fuel Assemblies at Kurchatov Atomic Energy Institute.
V. S. Osmachkin. 1974, 36p
In Russian. U.S. Sales Only.

Descriptors: (*Bwr type reactors, Fuel assemblies), (*Pwr type reactors, Fuel assemblies), (*Fuel assemblies, *Critical heat flux), Fluid flow, Heat transfer, Mockup, Simulation, Testing.

For abstract, see NSA 32 03, number 08020.

JUL-1136-RG PC$10.25/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorentwicklung.
Theoretical Analysis of the Critical Experiment Kahter.
W. Scherer, H. Gerwin, and R. D. Neef. Nov 74, 141p
In German. U.S. Sales Only.

Descriptors: (*Pwr type reactors, Fuel assemblies), (*Fuel assemblies, *Critical heat flux), Correlations, Departure nucleate boiling, Distribution, Power density, Spacers.

For abstract, see NSA 32 03, number 08095.

LA-5920-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Cooling Tower Modification for Intermittent Operation.
W. S. Midkiff. Mar 75, 4p
Contract W-7405-ENG-36

Descriptors: (*Owr reactor, *Cooling towers), Modifications, Operation.

For abstract, see NSA 32 03, number 08096.

NP-20300 PC$8.75/MF$2.25
Guadalajara Univ. (Mexico). Facultad de Ingenieria.
Safety Evaluation of the Emergency Electrical System of Unit No. 1 of the Laguna Verde Nuclear Power Plant.
L. S. Contreras. 1974, 112p
In Spanish. U.S. Sales Only.

Descriptors: (*Laguna verde-1 reactor, *Electrical equipment), Configuration, Diesel engines, Electronic circuits, Electronic equipment, Engineered safety systems, Specifications.

For abstract, see NSA 32 03, number 08025.

PB-243 943/8GA PC$10.50/MF$2.25
Battelle Columbus Labs., Ohio.
Study of a Fission Power Reactor Development Strategy for the United States.
Interim rept. Dec 74-May 75 on Phase 1,
W. M. Pardue, R. S. Denning, M. Pobereskin, R. L. Ritzman, and J. D. Waddell. 25 Jul 75, 404p*
BCL/NSF/C946-1

Descriptors: *Nuclear fission, *Electric power generation, *Electric power demand, Development, Forecasting, Breeder reactors, High temperature gas cooled reactors.
Identifiers: Liquid metal fast breeder reactors, LMFBR type reactors, LWBR type reactors.

The study described in this report is a continuation of a multistage effort to provide a meaningful and objective assessment of the alternative nuclear fission technology being developed to satisfy the electricity generation requirements of the United States in the period until 2020. The preliminary results in this study consisted primarily of the collection and analysis of massive amounts of data to permit an evaluation of the status of technology for four domestic advanced reactor types (the HTGR, GCFR, MSBR, and LWBR concepts) which are considered candidates for introduction into the existing (LWR) and predicted (LWR/LMFBR) nuclear generating mixes. In addition, preliminary assessments of the nature and extent of R and D requirements to ensure viability of these concepts have been undertaken. It is the intent in the current report to supply information relating to the extension of the technology assessment and to present in a qualitative manner the significant conclusions. A major additional purpose is to describe a newly developed modeling tool to be used for the evaluation of various possible fission-reactor development strategies that the nation might pursue. Finally, the report indicates the direction of study which will be pursued through the next few months to define the ultimate potential for and significance of advanced reactor commercialization.

PB-244 196/2GA PC$3.25/MF$2.25
Nuclear Regulatory Commission, Washington, D.C. Office of Nuclear Reactor Regulation.
Safety Evaluation Report Related to Construction of Summit Power Station Units 1 and 2. Delmarva Power and Light Company, Supplement No. 2, Docket Nos. 50-450 and 50-451.
Aug 75, 16p NUREG-75/004-Suppl-2
Supplement to report dated Jan 75, PB-239 337.

Descriptors: *Nuclear reactor safety, *Nuclear power plants, Nuclear reactor control, Nuclear

reactor engineering, Nuclear reactor containment, Circuits, Delaware.
Identifiers: *Summit nuclear power plant, New Castle County(Delaware).

Supplement No. 2 to the Safety Evaluation Report of the Delmarva Power & Light Company's application for licenses to construct and operate its proposed Summit Power Station, Units 1 and 2, to be located south of the Chesapeake and Delaware Canal in New Castle County, Delaware, has been prepared by the Office of Nuclear Regulation, Nuclear Regulatory Commission. The supplement consists of the staff's evaluation of additional information received from Delmarva Power & Light Company since issuance of Supplement No. 1 to the Safety Evaluation Report in May 1975. With this supplement, all of the outstanding items have now been reviewed by the staff and found to be acceptable.

PNCT-831-74-02 PC$11.00/MF$2.25
Power Reactor and Nuclear Fuel Development Corp., Tokai, Ibaraki (Japan). Tokai Works.
Tokai Works Semiannual Progress Report, January--June 1974.
Dec 74, 158p
U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, *Fuel pins), (*Bwr type reactors, *Fuel pellets), (*Pwr type reactors, Fuel pellets), (*Joyo reactor, Fuel pins), Fabrication, Performance testing, Physical radiation effects, Plutonium dioxide, Reactor cores, Research programs, Stainless steel-316, Uranium dioxide.

No abstract available.

RISO-M-1757 PC$8.75/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
Users Manual for the Pwr-Plasim Model.
P. la Cour Christensen. Mar 75, 114p
U.S. Sales Only.

Descriptors: (*Pwr type reactors, *Mathematical models), Computer codes, Hybrid computers, Nuclear power plants, Pressurizers, Reactor simulators, Real time systems, Simulation, Steam generators, Steam turbines.

For abstract, see NSA 32 03, number 08036.

SRD-R-35(Pt.2) PC$4.00/MF$2.25
UKAEA Safety and Reliability Directorate, Culcheth.
Part II: Diffusion Coefficients of Fission Products in Helium.
M. J. Lawler. 9p RPC/M3FPR/P-(74)5
U.S. Sales Only.

Descriptors: (*Dragon reactor, *Radionuclide migration), (*Cesium 137, Radionuclide migration), (*Silver 111, Radionuclide migration), (*Rubidium 89, Radionuclide migration), Chapman-enskog theory, Deposition, Diffusion, Fission products, Heat exchangers, Helium.

For abstract, see NSA 32 03, number 08097.

TID-3333-S2 PC$7.60/MF$2.25
Energy Research and Development Administration, Oak Ridge, Tenn. Technical Information Center.
Liquid Metal Fast Breeder Reactors, July 1973--December 1974.
D. C. Cunningham, and D. O. Galde. Jun 75, 269p

Descriptors: (*Lmfbr type reactors, *Bibliographies).

For abstract, see NSA 32 03, number 08072.

TRG-Report-2644(W) PC$4.00/MF$2.25
UKAEA Reactor Group, Risley.
Equipment for the Measurement of Pin Pressure and Fission Gas Release in Discharged Sghwr Fuel Pins.
J. M. O'Keefe. Jan 75, 12p
U.S. Sales Only.

Descriptors: (*Sghwr reactor, *Fuel pins), Fission products, Gases, Mass spectroscopy, Pressure measurement, Transducers, Voids, Volume.

For abstract, see NSA 32 03, number 08055.

TUBIK-37 PC$10.00/MF$2.25
Technische Univ. Berlin (F.R. Germany). Inst. fuer Kerntechnik.
Analytical Solution for the Temperature Fields in Rod Bundles Cooled by Liquid Metals Flowing Longitudinally in Any Predetermined Heat Flux.
S. Meier. Dec 74, 137p
In German. U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, Fuel element clusters), (*Fuel element clusters, *Heat transfer), Analytical solution, Asymmetry, Fluid flow, Fuel channels, Sturm-liouville equation, Temperature distribution, Three-dimensional calculations.

For abstract, see NSA 32 03, number 08074.

TUBIK-42 PC$12.25/MF$2.25
Technische Univ. Berlin (F.R. Germany). Inst. fuer Kerntechnik.
Experimental Determination of the alpha - Decay Constants at the Zero Power Reactor sur 100 Be. Experiments with Pulsed Neutron Sources: Effect of Higher Harmonics and Detector Position. Rossi alpha Experiment: Influence of Reactivity, Source Intensity, and Measurement Errors.
K. Lickteig. Feb 75, 185p
In German. U.S. Sales Only.

Descriptors: (*Sur-100 series reactor, Reactor noise), (*Reactor noise, *Pulsed neutron techniques), Alpha decay, Reactivity, Reactor kinetics, Reactor period, Rossi alpha method.

For abstract, see NSA 32 03, number 08098.

UJV-3357-R-Ch PC$4.25/MF$2.25
Ustav Jaderneho Vyzkumu, Rez (Czechoslovakia).
Removal of Low Concentrations of Boric Acid in Water Using Ion Exchange.
J. Kysela, J. Brabec, and F. Peterka. Jan 75, 21p
In Czech. U.S. Sales Only.

Descriptors: (*Tr-0 reactor, *Ion exchange materials), Boric acid, Performance.

For abstract, see NSA 32 03, number 08099.

UNI-SA-9 PC$4.00/MF$2.25
United Nuclear Industries, Inc., Richland, Wash.
Engineered Maintenance Approach to Improved Nuclear Plant Availability.
R. K. Robinson, J. T. Stringer, and M. L. Faught. Mar 75, 18p CONF-750416-2
Contract AT(45-1)-1857

Descriptors: (*N-reactor, *Reactor maintenance), Availability, Planning, Reactor operation.

For abstract, see NSA 32 03, number 08051.

WANL-TME-144 PC$5.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Westinghouse Astronuclear Laboratory Preliminary Proposal to Plum Brook Reactor Facility for the Nerva Radiation Effects Program.
13 Aug 62, 36p

Descriptors: (*Nerva reactor, *Planning), (*Pbr reactor, *Modifications), Radiation effects, Reactor components, Reactor experimental facilities, Reactor materials, Research programs.

For abstract, see NSA 32 03, number 08100.

WANL-TME-169 PC$5.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Western New York Nuclear Research Center Reactor Program.
H. P. Kalapaca. 6 Nov 62, 37p

Descriptors: (*Pulstar-buffalo reactor, *Research programs), Coaxial cables, Dielectric materials, Electron tubes, Nerva reactor, Planning, Preamplifiers, Radiation effects.

For abstract, see NSA 32 03, number 08101.

ZJE-156 PC$4.00/MF$2.25
Skoda, Plzen (Czechoslovakia). Zavod Jaderne Elektrarny.
Charging Machine in the a-1 Nuclear Power Plant.
J. Lavicka, J. Korenek, and J. Hejman. 1974, 13p
U.S. Sales Only.

Descriptors: (*Bohunice a-1 reactor, *Reactor charging machines), Fabrication, Specifications, Testing.

For abstract, see NSA 32 03, number 08056.

18F. Radiation Shielding and Protection

BNWL-1903 PC$5.45/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Impact Testing of Vitreous Simulated High-Level Waste in Canisters.
T. H. Smith, and W. A. Ross. May 75, 115p
Contract AT(45-1)-1830

Descriptors: (*Radioactive wastes, *Transport), (*Casks, *Impact tests), Glass, Safety, Vitrification.

For abstract, see NSA 32 03, number 07244.

DPSPU-74-124-4 PC$8.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Plant.
Safety Analysis Report: Packages. Lp-12 Tritium Package (Packaging of Fissile and Other Radioactive Materials). Final Report.
A. A. Gates, P. G. McCarthy, and J. W. Edl. May 75, 100p
Contract AT(07-2)-1

Descriptors: (*Tritium, *Transport), (*Casks, *Safety), Aluminium, Containment, Criticality, Design, Heat transfer, Mechanical tests, Packaging, Performance testing, Quality assurance, Shielding, Stainless steels, Thermal insulation.

For abstract, see NSA 32 03, number 07246.

DPSPU-74-124-5 PC$7.25/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Plant.

Safety Analysis Report: Packages. Lp-50 Tritium Package (Packaging of Fissile and Other Radioactive Materials). Final Report.
A. A. Gates, P. G. McCarthy, and J. W. Edl. Apr 75, 85p
Contract AT(07-2)-1

Descriptors: (*Tritium, *Transport), (*Casks, *Safety), Accidents, Containment, Criticality, Design, Heat transfer, Mechanical tests, Packaging, Quality assurance, Shielding.

For abstract, see NSA 32 03, number 07247.

ERDA-8 PC$4.00/MF$2.25
Energy Research and Development Administration, Washington, D.C. Div. of Waste Management and Transportation.
Transportation of High-Level Nuclear Wastes.
Nov 74, 4p

Descriptors: (*Radioactive wastes, *Radiation hazards), (*Casks, *Safety), Accidents, Design, Environment, Fabrication, Man, Recommendations, Transport.

For abstract, see NSA 32 03, number 07248.

EUR-5212e PC$4.00/MF$2.25
Commission of the European Communities, Ispra (Italy). Joint Research Centre.
Morse-E: A New Version of the Morse Code, Eels.
C. Ponti, and R. Van Heusden. 1974, 15p
U.S. Sales Only.

Descriptors: (*Computer codes, *M codes), (*Shielding, Computer codes), E codes, Errors, Geometry, Monte carlo method, Radiation flux.

For abstract, see NSA 32 03, number 07899.

JUL-1133-PC PC$5.25/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Physikalische Chemie.
Simple Method for the Calculation of Multilayered Shields for gamma Sources.
P. F. Sauermann. Nov 74, 41p
In German. U.S. Sales Only.

Descriptors: (*Water, *Photon transport), (*Concretes, Photon transport), (*Iron, Photon transport), (*Lead, Photon transport), Absorption, Gamma radiation, Uranium.

For abstract, see NSA 32 03, number 07900.

NTO-I-0282 PC$6.50/MF$2.25
NERVA Test Operations, Jackass Flats, Nev.
Nto Procedure for Phase V Shielding Integrity (Sic) Tests at E-MAD Facility. Final Issue.
7 Sep 67, 69p

Descriptors: (*Hot labs, *Shielding), Testing.

For abstract, see NSA 32 03, number 07901.

TID/SNA-361 PC$5.25/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Development of an Integrated System of Neutron-Induced-Activation and Shielding Computer Codes for Complex Engineering Structures. Folder 2. Business Management.
23 Oct 69, 43p

Descriptors: (*Nerva reactor, Shielding), (*Shielding, *Computer calculations), Computer codes, Gamma transport theory, Neutron transport theory, Planning.

For abstract, see NSA 32 03, number 07902.

Y-DD-41 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Y-12 Drum-Type Shipping Container Specifications.
G. R. Handley, and E. C. Crume, Jr. 6 Aug 69, 19p
Contract W-7405-eng-26

Descriptors: (*Fissile materials, *Criticality), (*Casks, *Design), Cost, Enriched uranium, Packaging, Safety, Transport.

For abstract, see NSA 32 03, number 07250.

18G. Radioactive Wastes and Fission Products

AI-ERDA-13151 PC$5.45/MF$2.25
Atomics International Div., Canoga Park, Calif.
Disposal of Transuranic Solid Waste Using Atomics International Molten Salt Combustion Process.
D. E. McKenzie, L. F. Grantham, R. B. Paulson, W. L. Richards, and R. B. Rennick. 5 May 75, 68p
Contract AT(04-3)-701

Descriptors: (*Radioactive waste processing, *Combustion), (*Radioactive waste disposal, *Solid wastes), (*Plutonium, *Recovery), Cost, Leaching, Molten salts, Radioactive wastes, Safety, Sodium chlorides, Transuranium compounds.

For abstract, see NSA 32 03, number 06080.

ARH-SA-204 PC$4.00/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Plutonium Criticality Considerations in Reprocessing Wastes and Contaminated Soils.
R. D. Carter. Mar 75, 17p CONF-750411-4
Contract AT(45-1)-2130

Descriptors: (*Radioactive waste disposal, *Liquid wastes), (*Plutonium, *Criticality), (*Soils, *Radionuclide migration), Aqueous solutions.

For abstract, see NSA 32 03, number 06082.

ARH-SA-210 PC$4.75/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Glass Forms for Immobilization of Hanford Wastes.
W. W. Schulz, A. L. Dressen, C. W. Hobbick, and H. Babad. Mar 75, 31p CONF-750535-4

Descriptors: (*Radioactive waste processing, *Vitrification), (*Hapo, *Radioactive waste management), Radioactive waste storage, Solid wastes.

For abstract, see NSA 32 03, number 06083.

ARH-SA-212 PC$4.00/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Atlantic Richfield Hanford Company Chemical Operator Training Program.
R. G. Zumhoff. Jan 75, 11p CONF-750515-3
Contract AT(45-1)-2130

Descriptors: (*Personnel, *Education), Radioactive waste processing, Reprocessing, Spent fuels.

For abstract, see NSA 32 03, number 08418.

ARH-ST-118A PC$4.25/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Atlantic Richfield Hanford Company Semiannual Report, BB Process Development, November 1, 1973 Through April 30, 1974.
R. D. Fox. Mar 75, 68p
Contract AT(45-1)-2130

Descriptors: (*Plutonium dioxide, *Dissolution), (*Plutonium, *Leaching), (*Soils, Leaching), Radioactive waste management, Research programs, Hydrofluoric acid, Nitric acid, Amines, Ashes, Molten salts, Nitrogen oxides, Off-gas systems, Aromatics, Solvent extraction, Solvent properties, Tbp, Organic ion exchangers, Temperature dependence.

For abstract, see NSA 32 03, number 06084.

ARH-2059 PC$4.25/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Thermal Process for Immobilization of Radioactive Wastes.
L. E. Brownell, R. E. Isaacson, M. J. Kupfer, and W. W. Schulz. 15 Apr 71, 21p

Descriptors: (*Radioactive waste processing, *Smelting), (*Hapo, Radioactive waste processing), Aluminium, Basalt, Sand, Solid wastes.

For abstract, see NSA 32 03, number 06081.

BNL-19688 PC$4.50/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Tritium Storage Development. Progress Report No. 2, October--December 1974.
Jan 75, 30p

Descriptors: (*Radioactive waste storage, *Research programs), (*Tritium, Radioactive waste storage), (*Radioactive waste processing, *Solidification), Cements, Concretes, Polymers, Tritium compounds.

No abstract available.

BNWL-B-406 PC$5.45/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Summary Report on Microstructure and Composition of Silicate Melts Containing Simulated Hanford Waste.
J. L. Daniel. Apr 75, 51p
Contract AT(45-1)-1830

Descriptors: (*Radioactive waste processing, *Solidification), Glass, Hapo, Microstructure, Silicates.

For abstract, see NSA 32 03, number 06086.

BNWL-SA-5311 PC$4.00/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Shielding Analysis of the Retrievable Surface Storage Facility.
M. G. Zimmerman. 1974, 6p CONF-750607-1
Contract RL-04-16A

Descriptors: (*Radioactive waste facilities, Shielding), (*Shielding, *Computer calculations), Analytical solution, Casks, Computer codes, Concretes, Htgr type reactors, Lmfbr type reactors, O codes, Pwr type reactors, Radiation hazards, Radioactive waste storage, Steels, Water.

For abstract, see NSA 32 03, number 07234.

CONF-750515-2 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Methods for Training Radiochemical Technicians at Ornl.
J. R. Parrott, and R. G. Nicol. 7p

Descriptors: (*Radiochemistry, Personnel), (*Personnel, *Education), Chemical preparation, Materials handling, Ornl, Radiation chemistry, Uranium oxides, Uranium 233.

For abstract, see NSA 32 03, number 08419.

CONF-750535-1 PC$5.25/MF$2.25
Oak Ridge National Lab., Tenn.
Leach Behavior of Cementitious Grouts Incorporating Radioactive Wastes.
H. W. Godbee, J. G. Moore, A. H. Kibbey, and D. S. Joy. 1975, 42p

Descriptors: (*Radioactive waste processing, *Solidification), (*Radioactive waste storage, *Leaching), Cesium 137, Curium 244, Liquid wastes, Mortars, Plutonium 239, Strontium 85.

For abstract, see NSA 32 03, number 06089.

COO-2510-4 PC$4.50/MF$2.25
Pennsylvania State Univ., University Park Materials Research Labs.
Ceramic Nuclear Waste Forms. II. A Ceramic-Waste Composite Prepared by Hot Pressing. Progress Report and Preprint.
G. J. McCarthy. 23 Apr 75, 28p CONF-750535-3
Contract AT(11-1)-2510

Descriptors: (*Radioactive waste processing, *Hot pressing), Ceramics, Composite materials, Leaching, Radioactive wastes, Solid wastes, Stability.

For abstract, see NSA 32 03, number 06090.

DP-MS-74-69 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Incorporation of Savannah River Plant Radioactive Waste into Concrete.
J. A. Stone. 1975, 18p CONF-750535-5
Contract AT(07-2)-1

Descriptors: (*Radioactive waste processing, *Solidification), (*Savannah river plant, Radioactive waste processing), Concretes, Leaching, Mechanical properties.

For abstract, see NSA 32 03, number 06091.

DP-MS-74-70 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Incorporation of Savannah River Plant Radioactive Waste into Glass.
J. A. Kelley. 1975, 19p CONF-750535-2
Contract AT(07-2)-1

Descriptors: (*Radioactive waste processing, *Vitrification), (*Savannah river plant, Radioactive waste processing), Cesium, Leaching, Radioactive wastes, Ruthenium, Volatility.

For abstract, see NSA 32 03, number 06092.

KFK-2089 PC$4.00/MF$2.25
Gesellschaft fuer Kernforschung m.b.H., Karlsruhe (F.R. Germany).
Experiences in the Management of Plutonium-Containing Solid-Wastes at the Nuclear Research Center, Karlsruhe.
W. Baehr, W. Hild, and K. Scheffler. Oct 74, 16p CONF-741026-10
U.S. Sales Only.

Descriptors: (*Radioactive waste disposal, *Underground disposal), (*Plutonium, Radioactive waste disposal), Fuel fabrication plants, Fuel reprocessing plants, German federal republic, Salt deposits, Solid wastes.

For abstract, see NSA 32 03, number 07235.

LIB/Trans-548 PC$5.50/MF$2.25
Developments in the Management of Low and Intermediate Activity Solid Wastes at the Cadarache Centre.
A. Barbreau, J. Marcaillou, J. Mery, D. Pinto, and D. Rancon. Jan 75, 49p CONF-700905-15
Translation by W. Buykx of SM--137/16. U.S. Sales Only.

Descriptors: (*Cea cadarache, *Radioactive waste management), (*Radioactive waste disposal, *Radiation hazards), Combustion, Containers, Cost, Plutonium, Radioactive wastes, Radioactivity, Radionuclide migration, Sodium, Soils, Solid wastes, Underground disposal, Uranium.

For abstract, see NSA 32 03, number 07236.

RISO-M-1786 PC$6.75/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
Radioactive Waste from Nuclear Power Plants and from the Stages of the Nuclear Fuel Cycle.
K. Brodersen. Mar 75, 72p
U.S. Sales Only.

Descriptors: (*Nuclear power plants, *Radioactive wastes), (*Fuel fabrication plants, Radioactive wastes), (*Fuel reprocessing plants, Radioactive wastes), Fuel cycle, Radioactive waste disposal, Radioactive waste management, Radioactive waste storage, Reprocessing, Waste management.

For abstract, see NSA 32 03, number 07237.

SAND-74-7017 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Nuclear Wastes in the Deep Seabed.
W. P. Bishop, D. R. Anderson, and C. D. Hollister. 1974, 8p CONF-750522-1

Descriptors: (*Radioactive waste disposal, *Marine disposal), Casks, Fuel cycle, Nuclear power plants, Radiation hazards, Radioactive wastes, Safety, Sea bed, Seas, Sediments, Underwater.

For abstract, see NSA 32 03, number 07238.

SAND-75-5294 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
High Level Waste Melting Experiment.
R. D. Klett. 1975, 16p CONF-750321-1

Descriptors: (*Radioactive waste disposal, *Underground disposal), Melting, Rocks, Solid wastes.

For abstract, see NSA 32 03, number 07239.

18H. Radioactivity

SC-RR-69-855 PC$6.50/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Buckl: A Program for Rapid Calculation of X-Ray Deposition.
R. K. Cole, Jr. Jul 70, 69p

Descriptors: (*Photon transport, Computer codes), (*Computer codes, *B codes), (*X radiation, *Absorption), Fortran, Geometric buckling.

For abstract, see NSA 32 03, number 07873.

SC-RR-70-187 PC$7.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Wondy/Buckl.
R. K. Cole, Jr, and D. A. Dahlgren. Jun 70, 77p

Descriptors: (*Photon transport, Computer codes), (*Computer codes, *W codes), (*X radiation, *Absorption).

For abstract, see NSA 32 03, number 07874.

SC-RR-710713 PC$18.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Improvements in the Chart D Radiation-Hydrodynamic Code II: A Revised Program.
S. L. Thompson, and H. S. Lauson. Mar 74, 299p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *C codes), (*Radiation transport, Computer codes), (*Hydrodynamics, Computer codes), (*Heat transfer, Computer codes), Cylindrical configuration, Diffusion, Electrons, Energy transport, Lagrange equations, One-dimensional calculations, Rectangular configuration, Spherical configuration.

No abstract available.

Y-DD-176 PC$6.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Analysis of Long-Term Data on Uranium in Air at Y-12.
M. Sanders. 58p CONF-750445-3

Descriptors: (*Uranium, *Fabrication), (*Air, *Safety standards), (*Y-12 plant, Safety standards), Contamination, Control, Data, Working conditions.

For abstract, see NSA 32 03, number 06370.

18I. Reactor Engineering and Operation

ANCR-1196 PC$10.60/MF$2.25
Aerojet Nuclear Co., Idaho Falls, Idaho.
Experiment Data Report for Semiscale MOD-1 Tests S-01-4 and S-01-4A (Isothermal Blowdown with Core Resistance Simulator).
S. N. Zender, M. F. Jensen, and K. E. Sackett. Mar 75, 287p
Contract AT(10-1)-1375

Descriptors: (*Loft reactor, Blowdown), (*Blowdown, *Simulation), Data, Eccs, Pressure suppression, Reactor accidents.

For abstract, see NSA 32 03, number 08202.

ANCR-1197 PC$7.60/MF$2.25
Aerojet Nuclear Co., Idaho Falls, Idaho.
Experiment Data Report for Semiscale MOD-1 Test S-01-5 (Isothermal Blowdown with Core Resistance Simulator).
S. N. Zender, H. S. Crapo, M. F. Jensen, and K. E. Sackett. Apr 75, 162p
Contract AT(10-1)1375

Descriptors: (*Loft reactor, *Blowdown), Data, Diagrams, Eccs, Loss of coolant, Reactor safety, Simulation.

For abstract, see NSA 32 03, number 08203.

CEA-1771 PC$7.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. de Transfert et Conversion d'Energie.
Thermal Hydraulic Study on a Local Flow Blockage around a Fuel Element in an Annular Channel.
J. Lafay, and M. Picut. May 74, 78p
In French. U.S. Sales Only.

Descriptors: (*Lmfbr type reactors, Flow blockage), (*Flow blockage, *Heat transfer), Fuel assemblies, Fuel elements, Hydraulics, Mockup, Pressure drop, Reactor cores, Simulation, Temperature distribution.

For abstract, see NSA 32 03, number 08208.

COO-2152-17 PC$4.00/MF$2.25
Cincinnati Univ., Ohio Dept. of Chemical and Nuclear Engineering.
Investigation of Pressure Drops and Heat Transfer Coefficients for Loss of Coolant Evaluations. Quarterly Progress Report for Period Ending March 31, 1975.
J. Weisman. 1975, 13p

Contract AT(11-1)-2152

Descriptors: (*Bwr type reactors, Loss of coolant), (*Pwr type reactors, Loss of coolant), (*Loss of coolant, *Heat transfer), Data, Flow rate, Mockup, Pressure gradients, Simulation, Transients, Transition boiling, Two-phase flow.

No abstract available.

EPRI-NP-2 PC$4.00/MF$2.25
Electric Power Research Inst., Palo Alto, Calif.
Nuclear Power Division: Research Progress Report Np-2.
Feb 75, 31p

Descriptors: (*Bwr type reactors, Reactor safety), (*Pwr type reactors, Reactor safety), (*Reactor safety, *Research programs), Fracture properties, Fuel densification, Fuel elements, Plutonium recycle, Reactor instrumentation, Stainless steels, Stress corrosion, Testing, Thorium.

For abstract, see NSA 32 03, number 08220.

ERDA-tr-27(V.1) PC$6.50/MF$2.25
Internationale Atomreaktorbau G.m.b.H. (INTERATOM), Bensberg/Koeln (F.R. Germany).
Experimental and Theoretical Investigations on Safety of the Snr - Straight-Tube Design Steam Generator with Sodium-Water Reactions.
K. Dumm, F. Sauermann, W. Schnitker, and A. Welter. Apr 72, 70p
Translation of INTAT--72.19(Vol.1).

Descriptors: (*Snr reactor, *Reactor accidents), Design, Reactor safety, Sodium, Steam, Steam generators, Water.

For abstract, see NSA 32 03, number 08221.

ERDA-tr-27(V.2) PC$8.75/MF$2.25
Internationale Atomreaktorbau G.m.b.H. (INTERATOM), Bensberg/Koeln (F.R. Germany).
Experimental and Theoretical Investigations on Safety of the Snr - Straight-Tube Design Steam Generator with Sodium-Water Reactions.
K. Dumm, F. Sauermann, W. Schnitker, and A. Welter. Apr 72, 113p
Translation of INTAT--72.19(Vol.2).

Descriptors: (*Snr reactor, *Reactor accidents), Design, Diagrams, Reactor safety, Sodium, Steam generators, Water.

No abstract available.

GA-A-13081 PC$5.45/MF$2.25
Gulf General Atomic Co., San Diego, Calif.
Gas Turbine Htgr Power Plant Control and Safety Studies. Quarterly Progress Report, April 1, 1974--June 30, 1974.
18 Sep 74, 127p
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, Reactor control systems), (*Reactor control systems, *Research programs), (*Reactor protection systems, Research programs), Design, Failures, Fission products, Gas turbines, Helium, Planning, Radionuclide migration, Reactor accidents, Reactor components, Reactor kinetics, Reactor operation, Reactor safety, Removal, Transients.

No abstract available.

GERHTR-90 PC$4.00/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorwerkstoffe und Heisse Zellen.
Determination of a Geometry-Dependent Parameter and Development of a Calculation Model for Describing the Fission Products Transport from Spherical Fuel Elements of Graphite Moderated Gas-Cooled Reactors.
R. Weissfloch. Jul 73, 43p
Translation of JUL--985-RW.

Descriptors: (*Htgr type reactors, *Fission product release), Fuel spheres, Mathematical models, Reactor safety.

For abstract, see NSA 32 03, number 08223.

JPNRSR-1 PC$6.00/MF$2.25
Science and Technology Agency, Tokyo (Japan). Atomic Energy Bureau.
Project and Program Information File.
Oct 74, 58p
U.S. Sales Only.

Descriptors: (*Japan, Reactor safety), (*Reactor safety, *Research programs), Nuclear power plants, Reactor accidents, Reactor components, Reactor materials.

For abstract, see NSA 32 03, number 08226.

KFK-2086 PC$5.25/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany).
Sensitivity Studies for Fast Reactor Whole Core Accidents.
G. Evrard, R. Froehlich, A. Renard, P. Schmuck, and M. Stievenart. Mar 75, 43p
U.S. Sales Only.

Descriptors: (*Snr reactor, *Excursions), (*Lmfbr type reactors, Excursions), Computer calculations, Design, Power distribution, Reactivity insertions, Reactor core disruption, Transients.

For abstract, see NSA 32 03, number 08228.

LIB/Trans-549 PC$4.00/MF$2.25
Blowdown Investigations with Refrigerant R12.
W. Belda, F. Mayinger, and K. P. Viert. 1974, 12p CONF-740468-4
Translated by W. Va Peer from German. U.S. Sales Only.

Descriptors: (*Blowdown, *Simulation), (*Water cooled reactors, Blowdown), Burnout, Comparative evaluations, Coolant loops, Fluid flow, Heat transfer, Organic halogen compounds, Pressure drop, Thermodynamics, Water.

For abstract, see NSA 32 03, number 08229.

LIB/Trans-550 PC$4.00/MF$2.25
Simulation of Events in the Propagation of Pressure Waves by Means of Multiple-Point Models.
K. Wolfert. Dec 74, 6p CONF-740468-5
Translated by U. Engelbert from German. U.S. Sales Only.

Descriptors: (*Primary coolant circuits, *Flow models), (*Water cooled reactors, *Fluid flow), Pressure gradients, Simulation, Transients, Velocity, Wave propagation.

For abstract, see NSA 32 03, number 08230.

MRR-141 PC$5.25/MF$2.25
Technische Univ. Muenchen, Garching (F.R. Germany). Lab. fuer Reaktorregelung und Anlagensicherung.
Concept for Perturbation Analysis, Described on the Example of the Malfunction of the Principal Coolant Pump in a Pressurized Water Reactor.
W. E. Buettner. Oct 74, 43p
In German. U.S. Sales Only.

Descriptors: (*Pwr type reactors, Primary coolant circuits), (*Primary coolant circuits, *Pumps), Failures, Reactor safety, System failure analysis.

For abstract, see NSA 32 03, number 08231.

NJD-9 PC$24.75/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Xe-Safety Analysis Report.
Jul 67, 432p

Descriptors: (*Xe-prime reactor, *Reactor safety), Criticality, Hazards, Hydrogen, Management, Meteorology, Radiation doses, Safety, Test facilities.

For abstract, see NSA 32 03, number 08232.

NTIS/PS-75/659/3GA PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Accident Risks in Nuclear Facilities (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
David W. Grooms. Aug 75, 136p*

Descriptors: *Bibliographies, *Nuclear reactor accidents, *Risk, Nuclear power plants, Nuclear reactor safety, Nuclear fuel reprocessing, Transportation, Radiation hazards, Radioactive materials, Environmental surveys.

The bibliography presents risk analysis and hazards evaluation of the design, construction and operation of nuclear facilities including the risk and hazards of transporting radioactive materials to and from these facilities. Radiological calculations for environmental effects of nuclear accidents are included. (Contains 131 abstracts)

NUREG-75/037 PC$5.25/MF$2.25
Nuclear Regulatory Commission, Washington, D.C.
Safety Evaluation of the Loss of Fluid Test Facility Project No. 394.
May 75, 112p

Descriptors: (*Loft reactor, *Reactor safety), Design, Eccs, Engineered safety systems, Loss of coolant, Reactor accidents, Reactor sites, Safety, Test facilities.

For abstract, see NSA 32 03, number 08233.

ORNL-SUB-3131-9 PC$7.75/MF$2.25
Battelle Columbus Labs., Ohio.
Elastic Stresses at Reinforced Nozzles in Spherical Shells with Pressure and Moment Loading. Phase Report 117-9.
E. C. Rodabaugh, and R. C. Gwaltney. 28 Apr 75, 91p

Descriptors: (*Power reactors, Pressure vessels), (*Pressure vessels, *Nozzles), Spherical configuration, Standards, Stresses.

For abstract, see NSA 32 03, number 08354.

ORNL-TM-4805(V.3) PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Quarterly Progress Report on Reactor Safety Programs Sponsored by the Nrc Division of Reactor Safety Research for October--December 1974. III. Liquid-Metal-Cooled Fast Breeder Reactor Safety.
M. H. Fontana, and T. S. Kress. Apr 75, 32p
Contract W-7405-eng-26

Descriptors: (*Lmfbr type reactors, Reactor core disruption), (*Reactor core disruption, *Fission product release), (*Reactor safety, *Research programs), Aerosols, Evaporation,

Mockup, Reactor vessels, Simulation, Transuranium elements, Uranium dioxide.

No abstract available.

PB-243 874/5GA PC$5.25/MF$2.25
Science Applications, Inc., Palo Alto, Calif.
Generalized Fault Tree Analysis for Reactor Safety.
Interim rept.,
E. T. Rumble, F. L. Leverenz, Jr., and R. C. Erdmann. Jun 75, 113p SAI/SR-109-PA EPRI-217-2-2

Descriptors: *Nuclear reactor safety, *Nuclear reactor accidents, Mathematical logic, Mathematical models, Trees(Mathematics), Boolean algebra, Theorems.
Identifiers: *Fault tree analysis.

This report describes methods for constructing detailed logic sequences that relate individual faults along an entire accident chain. The methods allow for detailed evaluation of system interactions with explicit consideration of mutually exclusive, dependent and common mode events included. A mathematical development of the AND-OR-NOT logic operations and their incorporation into a computer code (BAM) for logic tree evaluation based upon a truth table approach is discussed. Two examples are analyzed, a portion of the consequence limiting control system for a PWR, and a redundant water supply pump system, which indicate how the methodology can handle certain types of common failure modes. A brief comparison with other logic codes completes the report.

RISO-M-1785 PC$4.50/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
Response to the Csni AD Hoc Group Standard Problem Program. The Usaec Standard Problem One for Blowdown.
P. S. Andersen. Mar 75, 26p
U.S. Sales Only.

Descriptors: (*Pwr type reactors, Blowdown), (*Bwr type reactors, Blowdown), (*Blowdown, *Computer calculations), Computer codes, Hydraulics, Liquid flow, Reactor safety, T codes, Temperature distribution.

No abstract available.

RISO-M-1974 PC$4.00/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
Assumptions Underlying Reliability Prediction.
J. R. Taylor. Apr 75, 12p
U.S. Sales Only.

Descriptors: (*Nuclear power plants, *Reliability), Failures, Fault tree analysis, Planning.

For abstract, see NSA 32 03, number 08236.

RN-S-0288 PC$9.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Nrx/Est Malfunction Analysis.
Jun 66, 120p

Descriptors: (*Nrx-a4-est reactor, *Reactor control systems), Failures, Limiters, Mathematical models, Reactor components, Reactor safety, Simulation.

For abstract, see NSA 32 03, number 08375.

RT/ING-(74)15 PC$4.50/MF$2.25
Comitato Nazionale per l'Energia Nucleare, Rome (Italy).
Role of Digital and Hybrid Simulation as a Tool in Designing a Nuclear Plant Control System.
P. Di Porto, and G. Vaccarino. 1974, 26p CONF-730704-4
U.S. Sales Only.

Descriptors: (*Reactor control systems, *Design), (*Pec brasimone reactor, Reactor control systems), Digital computers, Hybrid computers, Reactor simulators, Simulation.

For abstract, see NSA 32 03, number 08376.

TID-3525-R5-S9 PC$5.45/MF$2.25
Energy Research and Development Administration, Oak Ridge, Tenn. Technical Information Center.
Reactor Safety. A Literature Search.
J. W. Rushing. May 75, 100p

Descriptors: (*Reactor safety, *Bibliographies), (*Nuclear power plants, Reactor safety), Indexes, Reactor operation, Safety engineering.

For abstract, see NSA 32 03, number 08238.

WANL-TME-1633 PC$14.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx-A6 Safety Evaluation Report.
Oct 67, 225p

Descriptors: (*Nrx-a6 reactor, *Performance testing), (*Test facilities, *Safety), Hydrogen, Management, Reactor safety.

For abstract, see NSA 32 03, number 08239.

WANL-TME-1662 PC$7.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Preliminary Examination of an Auxiliary Thrust Safety Countermeasure with Respect to Post-Operational Integrity of the Nerva Reactor.
W. S. Brown. Sep 67, 84p

Descriptors: (*Nerva reactor, *Safety), Radiation protection, Reactor accidents, Rockets, Space flight.

For abstract, see NSA 32 03, number 08240.

WANL-TNR-117 PC$8.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Hydrodynamics of Nerva Core Immersion.
C. A. Bodenschatz. 105p

Descriptors: (*Nerva reactor, *Excursions), Hydrodynamics, Reactor cores, Reactor safety, Reactor shutdown, Seas.

For abstract, see NSA 32 03, number 08241.

WASH-1535(Vol.1) PC$10.50/MF$2.25
USAEC, Washington, D.C.
Liquid Metal Fast Breeder Reactor Program. Volume I. Environmental Statement.
Dec 74, 149p

Descriptors: (*Usa, *Energy demand), (*Lmfbr type reactors, *Environmental effects), Cost benefit analysis, Economics, Electric power, Energy supplies, Environment, Environmental impact statements, Planning.

For abstract, see NSA 32 03, number 08242.

WASH-1535(Vol.2) PC$50.25/MF$2.25
USAEC, Washington, D.C.
Liquid Metal Fast Breeder Reactor Program. Volume II. Environmental Statement.
Dec 74, 945p

Descriptors: (*Lmfbr type reactors, *Environmental effects), (*Usa, Lmfbr type reactors), Construction, Environment, Environmental impact statements, Fuel cycle, Fuel fabrication plants, Fuel reprocessing plants, Plutonium, Radioactive waste disposal, Radioactive wastes, Reactor accidents, Reactor operation, Reactor sites, Toxicity, Transport.

For abstract, see NSA 32 03, number 08243.

WASH-1535(Vol.3) PC$34.25/MF$2.25
USAEC, Washington, D.C.
Liquid Metal Fast Breeder Reactor Program. Volume III. Environmental Statement.
Dec 74, 623p

Descriptors: (*Lmfbr type reactors, *Environmental effects), (*Usa, *Energy conservation), Cost benefit analysis, Energy sources, Energy supplies, Environment, Environmental impact statements, Gcfr type reactors, Geothermal energy, Htgr type reactors, Hydroelectric power, Lwbr type reactors, Thermonuclear reactors, Water cooled reactors.

For abstract, see NSA 32 03, number 08244.

WASH-1535(Vol.4) PC$31.00/MF$2.25
USAEC, Washington, D.C.
Liquid Metal Fast Breeder Reactor Program. Volume IV. Environmental Statement.
Dec 74, 556p

Descriptors: (*Usa, Lmfbr type reactors), (*Lmfbr type reactors, *Environmental effects), Cost benefit analysis, Economics, Environment, Environmental impact statements, Fuel cycle, Nuclear materials management, Reactor decommissioning, Safeguards.

For abstract, see NSA 32 03, number 08245.

WASH-1535(Vol.5) PC$35.25/MF$2.25
USAEC, Washington, D.C.
Liquid Metal Fast Breeder Reactor Program. Volume V. Environmental Statement.
Dec 74, 641p

Descriptors: (*Usa, Lmfbr type reactors), (*Lmfbr type reactors, *Environmental effects), Environment, Environmental impact statements, Public relations.

For abstract, see NSA 32 03, number 08246.

WASH-1535(Vol.6) PC$35.75/MF$2.25
USAEC, Washington, D.C.
Liquid Metal Fast Breeder Reactor Program. Volume VI. Environmental Statement.
Dec 74, 653p

Descriptors: (*Usa, Lmfbr type reactors), (*Lmfbr type reactors, *Environmental effects), Environment, Environmental impact statements, Public relations.

For abstract, see NSA 32 03, number 08247.

WASH-1535(Vol.7) PC$34.00/MF$2.25
USAEC, Washington, D.C.
Liquid Metal Fast Breeder Reactor Program. Volume VII. Environmental Statement.
Dec 74, 619p

Descriptors: (*Usa, Lmfbr type reactors), (*Lmfbr type reactors, *Environmental effects), Environment, Environmental impact statements, Public relations.

For abstract, see NSA 32 03, number 08248.

18J. Reactor Materials

ALO-3 PC$4.00/MF$2.25
Energy Research and Development Administration, Albuquerque, N.Mex. Albuquerque Operations Office.
Inspector Measurement Verification Activities.
R. S. George, and R. B. Crouch. 10p CONF-750608-1

Descriptors: (*Nuclear materials management, *Measuring methods), (*Safeguards, Measuring methods), Accounting, Errors, Inspection, Inventories, Material balance, Measuring instruments, Performance.

For abstract, see NSA 32 03, number 07224.

ARH-LD-109 PC$4.00/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Reanalysis of Idealized Plutonium Dissolvers and the "Always Safe" Conditions.
C. O. Brown, and R. D. Carter. Feb 75, 14p
Contract AT(45-1)-2130

Descriptors: (*Plutonium 239, *Criticality), Aqueous solutions, Computer calculations, Dissolution, Safety.

For abstract, see NSA 32 03, number 07243.

ARH-SA-220 PC$4.00/MF$2.25
Atlantic Richfield Hanford Co., Richland, Wash.
Real-Time Plutonium Accountability and Inventory Control System.
J. P. Sarich. 6p CONF-750608-2

Descriptors: (*Plutonium, Safeguards), (*Safeguards, *Accounting), Computers, Data acquisition systems, Inventories, Nuclear materials management.

For abstract, see NSA 32 03, number 07225.

BN-7410-03 PC$4.75/MF$2.25
Societe Belge pour l'Industrie Nucleaire, Brussels.
Mops-C02(Vc-2) Experiment. Final Report.
M. Gaube. Oct 74, 32p
U.S. Sales Only.

Descriptors: (*Coated fuel particles, *Performance testing), (*Uranium dioxide, *Physical radiation effects).

For abstract, see NSA 32 03, number 08362.

BNWL-B-179 PC$6.25/MF$2.25
Battelle Pacific Northwest Labs., Richland, Wash.
Table of Sample Sizes Needed to Detect at Least One Defective with 100(1- alpha)% Probability (Alpha = 0.01, 0.05).
K. B. Stewart. 26 May 72, 62p
Contract AT(45-1)-1830

Descriptors: (*Fissionable materials, Safeguards), (*Safeguards, *Reliability), Nuclear materials management, Probability, Sampling, Statistics, Tables.

For abstract, see NSA 32 03, number 07226.

CEA-CONF-2786 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
Fundamental Results on Irradiated Carbides: Fission Products Release, Fuel Swelling and Evolution of Composition.
H. Mikailoff. 1974, 10p CONF-741017-25
U.S. Sales Only.

Descriptors: (*Fuel pins, *Fission product release), (*Plutonium carbides, *Physical radiation effects), (*Uranium carbides, Physical radiation effects), Microstructure, Swelling.

For abstract, see NSA 32 03, number 08363.

CONF-750514-2 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Application of Crime Countermeasures for the Protection of Nuclear Materials.
C. H. Bean. 1975, 9p
Contract W-31-109-Eng-38

Descriptors: (*Nuclear materials diversion, *Crime detection), (*Fissionable materials, *Safeguards), Fuel fabrication plants, Fuel reprocessing plants, Monitoring, Nuclear fuels, Nuclear industry, Nuclear materials management, Radiation detectors, Reactors, Safeguard regulations, Transport.

For abstract, see NSA 32 03, number 07227.

CONF-750515-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Review of Training Methods Employed in Nuclear Fuel Fabrication Plants.
W. D. Box, and F. N. Browder. 10p

Descriptors: (*Fuel fabrication plants, Personnel), (*Personnel, *Education), Accidents, Fabrication, Fuel elements, Nuclear industry, Safety.

For abstract, see NSA 32 03, number 06368.

CONF-750607-13 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
History of Coated Particles.
J. L. Scott. 1975, 7p

Descriptors: (*Coated fuel particles, *Research programs).

For abstract, see NSA 32 03, number 08364.

EPRI-SR-6 PC$3.25/MF$2.25
Electric Power Research Inst., Palo Alto, Calif.
Epri Programs on Plutonium Fuel Utilization.
B. A. Zolotar, M. E. Lapides, and F. E. Gelhaus. Feb 75, 11p CONF-741153-25

Descriptors: (*Bwr type reactors, Plutonium recycle), (*Pwr type reactors, Plutonium recycle), (*Plutonium recycle, *Economics), Fuel cycle, Nuclear fuels, Reprocessing.

For abstract, see NSA 32 03, number 08390.

ERDA-33 PC$5.45/MF$2.25
Energy Research and Development Administration, Washington, D.C.
Nuclear Fuel Cycle.
Mar 75, 107p

Descriptors: (*Power reactors, *Fuel cycle), Economics, Fabrication, Isotope separation, Mining, Ore processing, Plutonium recycle, Radioactive waste disposal, Reprocessing, Reviews, Uranium reserves.

For abstract, see NSA 32 03, number 08391.

EUR-5108e PC$5.75/MF$2.25
Commission of the European Communities, Ispra (Italy). Joint Research Centre.
Ultrasonic Signature.
E. Borloo, and S. Crutzen. 1974, 54p
U.S. Sales Only.

Descriptors: (*Fissile materials, Safeguards), (*Safeguards, *Physical protection devices), Ultrasonic waves.

For abstract, see NSA 32 03, number 07228.

ICP-1062 PC$4.00/MF$2.25
Allied Chemical Corp., Idaho Falls, Idaho Idaho Chemical Programs - Operations Office.
Breaking Silicon Carbide Coatings on Ft. St. Vrain Fertile Particles Using a Gas Jet. Interim Experimental Results.
W. B. Palmer. Mar 75, 14p
Contract AT(10-1)-1375

Descriptors: (*Coated fuel particles, *Crushing), (*Silicon carbides, Crushing), Fluidized bed, Jets, Reprocessing.

For abstract, see NSA 32 03, number 06103.

ICP-1070 PC$4.00/MF$2.25
Allied Chemical Corp., Idaho Falls, Idaho Idaho Chemical Programs - Operations Office.
Experimental Testing of the Double-Roll Crusher for Breaking Silicon Carbide Coatings on Unirradiated Ft. St. Vrain Fuel Particles.
W. B. Palmer. Apr 75, 16p
Contract AT(10-1)-1375

Descriptors: (*Coated fuel particles, *Crushing), Head end processes, Particle size, Vrain reactor.

For abstract, see NSA 32 03, number 06104.

LA-5889-PR PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Nuclear Analysis Research and Development. Program Status Report, September--December 1974.
Apr 75, 28p
Contract W-7405-eng-36

Descriptors: (*Fissile materials, *Nondestructive analysis), (*Safeguards, *Measuring methods), Lasl, Research programs.

No abstract available.

NBSIR-74-524 PC$4.75/MF$2.25
National Bureau of Standards, Washington, D.C.
Practicality of Diversion Path Analysis.
W. M. Murphey, and J. C. Schleter. Jul 74, 35p

Descriptors: (*Nuclear materials diversion, *Monitoring), (*Fissile materials, *Safeguards), Accounting, Data acquisition, Data processing, Material balance area, Material unaccounted for, Reliability.

For abstract, see NSA 32 03, number 07230.

NBSIR-74-592 PC$6.00/MF$2.25
National Bureau of Standards, Washington, D.C.
Safeguards Information System Flows Associated with the Plant Safeguards Authority.
J. C. Schleter. Nov 74, 58p

Descriptors: (*Fissile materials, Safeguards), (*Safeguards, *Information systems), Data acquisition, Data processing, Management, Nuclear facilities.

For abstract, see NSA 32 03, number 07231.

NUREG-75/010 PC$7.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Methods for the Accountability of Uranium Dioxide.
F. B. Stephens, R. G. Gutmacher, K. Ernst, and J. E. : Turel, S. P. Harrar. Jun 75, 178p

Descriptors: (*Uranium dioxide, *Accounting), (*Uranium 235, *Quantitative chemical analysis), (*Safeguards, *Measuring methods), Gravimetric analysis, Mass spectroscopy, Spectroscopy, Titration, Voltametry.

For abstract, see NSA 32 03, number 07232.

N75-26843/3GA PC$4.25/MF$2.25
Institut fuer Festkoerpermechanik, Freiburg (West Germany).
Shock Waves as Possible Causes of Damage to Nuclear Reactor Components.
Interim Report.
S. Winkler, and G. Sperl. Dec 74, 64p WB-8/74
In German; English Summary.

Descriptors: *Fragmentation, *Metallography, *Nuclear power reactors, *Reactor materials, *Shock waves, Blast loads, Microcracks, Nucleation, Power plants, Shock waves.

For abstract, STAR 1317

RD/B/N-3232 PC$4.00/MF$2.25
Central Electricity Generating Board, Berkeley (UK). Berkeley Nuclear Labs.
Simple Thermal Syphon Sodium Loops.
J. R. Gwyther, P. Marshall, D. Rowe, and D. Withrington. Nov 74, 10p
U.S. Sales Only.

Descriptors: (*Coolant loops, *Fabrication), Corrosion, Corrosive effects, Flow rate, Materials testing, Mechanical properties, Operation, Sodium, Stainless steels.

For abstract, see NSA 32 03, number 06237.

18K. Reactor Physics

CEA-N-1773 PC$11.75/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Div. d'Etude et de Developpement des Reacteurs.
Elaboration of a Set of a Coherent Nuclear Data for a Thermal Reactor Calculations: Qualification of the Code APOLLO.
M. L. Mikhail. Dec 74, 172p
In French. U.S. Sales Only.

Descriptors: (*Thermal reactors, *Reactor kinetics), (*Computer codes, *A codes), (*Nuclear data collections, *Cross sections), Mathematical models.

For abstract, see NSA 32 03, number 08307.

CONF-730611-19 PC$4.00/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Importance Function Fine Structure and the Central Worth Discrepancy.
E. Greenspan. 1972, 6p
Contract AT(11-1)-3073

Descriptors: Errors, Fine structure, Neutron importance function, Reactivity coefficients, Reactivity worths, Resonance.

For abstract, see NSA 32 03, number 08308.

CONF-750413-P1 PC$10.60/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Proceedings of the Conference on Computational Methods in Nuclear Engineering, Charleston, South Carolina, April 15--17, 1975. Volume I.
1975, 456p

Descriptors: (*Reactor kinetics, *Meetings), (*Nuclear engineering, Meetings), Computer codes, Leading abstract, Mathematical models.

For abstract, see NSA 32 03, number 08309.

CONF-750413-P2 PC$10.60/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Proceedings of the Conference on Computational Methods in Nuclear Engineering, Charleston, South Carolina, April 15--17, 1975. Volume II.
1975, 540p

Descriptors: (*Reactor kinetics, *Meetings), (*Nuclear engineering, Meetings), Computer codes, Leading abstract, Mathematical models.

For abstract, see NSA 32 03, number 08316.

CONF-750607-4 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Power Spectral Density Measurements with exp 252 CF for a Mock-Up of the Fftf.
J. T. Mihalczo, V. K. Pare, and M. V. Mathis. 1974, 6p

Descriptors: (*Reactivity, *Measuring methods), (*Lmfbr type reactors, Reactivity), Californium 252, Correlations, Fftf reactor, Fission, Neutron detection, Neutron detectors, Neutron sources, Neutron spectra, Reactor noise, Subcriticality, Zpr-9 reactor.

For abstract, see NSA 32 03, number 08340.

DP-1380 PC$4.00/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Joshua System.
H. C. Honeck. Apr 75, 45p
Contract AT(07-2)-1

Descriptors: (*K reactor, *Fuel management), (*P reactor, Fuel management), (*R reactor, Fuel management), Computer calculations, Mathematical models.

For abstract, see NSA 32 03, number 08104.

EURFNR-1236 PC$5.00/MF$2.25
Stichting Reactor Centrum Nederland, Petten.
Studies of Neutronic Coupling by Reactor Noise Analysis in the Time Domain for Facilities of Rcn, Petten.
E. Turkcan, and J. B. Dragt. Sep 74, 40p CONF-741065-45, RCN-218
U.S. Sales Only.

Descriptors: (*Reactor kinetics, *Reactor noise), (*Coupled reactor cores, Reactor kinetics), Reactor cores, Rossi alpha method, Stek reactor.

For abstract, see NSA 32 03, number 08341.

FEI-365 PC$4.00/MF$2.25
Gosudarstvennyj Komitet po Ispol'zovaniyu Atomnoj Ehnergii SSSR, Obninsk. Fiziko-Ehnergeticheskij Inst.
Some Applications of the Integral Parameters of Perturbation Theory in Reactor Research.
V. E. Levin, and V. Ya. Pupko. 1974, 20p
In Russian. U.S. Sales Only.

Descriptors: Data, Mathematics, Reactor kinetics, Temperature coefficient, Variations.

For abstract, see NSA 32 03, number 08342.

HEDL-TME-75-26 PC$4.00/MF$2.25
Hanford Engineering Development Lab., Richland, Wash.
User'S Manual for Computer Code Ribd-II, a Fission Product Inventory Code.
D. R. Marr. Jan 75, 23p
Contract AT(45-1)-2170

Descriptors: (*Nuclear fuels, Fission products), (*Computer codes, *R codes), (*Fission products, *Inventories), Activity levels, Afterheat, Data, Decay, Energy yield, Irradiation, Manuals.

For abstract, see NSA 32 03, number 08343.

JUL-1147-RG PC$6.25/MF$2.25
Kernforschungsanlage Juelich G.m.b.H. (F.R. Germany). Inst. fuer Reaktorentwicklung.
Treatment of Anisotropic Neutron Scattering in Numerical Reactor Physics.
H. Brockmann. Dec 74, 62p
U.S. Sales Only.

Descriptors: (*Neutron transport theory, *Scattering), (*Reactor kinetics, *Neutron transport), Accuracy, Anisotropy, Comparative evaluations, Computer calculations, Discrete ordinate method, Fast neutrons, Lithium, Monte carlo method, Multigroup theory, Neutron flux.

For abstract, see NSA 32 03, number 08345.

ORNL-TM-4750 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Fabgen, a Transient Power-Generation and Isotope Birth Rate Calculator.
H. C. Roland. Apr 75, 35p
Contract W-7405-eng-26

Descriptors: (*Fuel elements, *Isotope ratio), (*Computer codes, *F codes), Burnup, Computer calculations, Fission products, Neutron flux, Power density, Production, Time dependence.

For abstract, see NSA 32 03, number 08347.

ORNL-TM-4869 PC$6.26/MF$2.25
Oak Ridge National Lab., Tenn.
Users Manual for Tdt (Time-Dependent Task).
E. T. Tomlinson, H. L. Dodds, R. A. Lillie, and J. C. Robinson. Jun 75, 61p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *T codes), Multigroup theory, Neutron transport, One-dimensional calculations, Reactor kinetics equations, Time dependence.

For abstract, see NSA 32 03, number 08348.

18N. Snap Technology

AGC-2305 PC$4.00/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Comparison of Gimbal and Gas Injection Systems for Thrust Vector Control of the Nerva Engine.
Jul 62, 14p

Descriptors: (*Nerva reactor, Space flight), (*Space flight, *Control equipment), Comparative evaluations.

For abstract, see NSA 32 03, number 08106.

AGC-2506 PC$9.50/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Mandatory Facility Addition Engine Test Stand No. 1 at Nrds.
Jun 63, 130p

Descriptors: (*Nerva reactor, *Test facilities), Planning.

For abstract, see NSA 32 03, number 08107.

AGC-2671 PC$6.00/MF$2.25
Aerojet-General Corp., Azusa, Calif.

Presentation to Marshall Space Flight Center for Nerva Thrust Vector Control System.
Aug 63, 58p

Descriptors: (*Nerva reactor, Space flight), (*Space flight, *Control equipment).

For abstract, see NSA 32 03, number 08108.

AGC-2703 PC$18.25/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Summary of Nerva Instrumentation Review Meeting at Snpo-C August 13, 14, and 15, 1963.
Sep 63, 302p

Descriptors: (*Nerva reactor, Reactor instrumentation), (*Reactor instrumentation, *Testing), Accelerometers, Data acquisition systems, Strain gages, Thermocouples, Transducers.

For abstract, see NSA 32 03, number 08109.

AI-AEC-12641 PC$11.75/MF$2.25
Atomics International Div., Canoga Park, Calif.
Snap Reactor Programs Progress Report, November 1967--January 1968.
R. L. Detterman. 20 Mar 68, 174p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Control elements), Fuel elements, Performance testing, Reactor cores, Reactor kinetics, Research programs, Safety, Shielding, S8dr reactor.

No abstract available.

AI-AEC-12870 PC$9.25/MF$2.25
Atomics International Div., Canoga Park, Calif.
Snap Reactor Programs Progress Report, May--July 1969.
J. G. Asquith. 30 Sep 69, 125p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Control elements), Fuel elements, Performance testing, Research programs, Shielding, Specifications, S8dr reactor, Thermoelectric generators.

No abstract available.

AI-AEC-12953 PC$12.50/MF$2.25
Atomics International Div., Canoga Park, Calif.
Snap Reactor Programs Progress Report, February--April 1970.
15 Jun 70, 190p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Control elements), Fuel elements, Inspection, Performance testing, Reactor cores, Reentry, Research programs, Safety, Shielding, Specifications, Stress analysis, S8dr reactor, Thermoelectric generators.

No abstract available.

AI-AEC-12982 PC$15.00/MF$2.25
Atomics International Div., Canoga Park, Calif.
Snap Reactor Programs Progress Report, August--October 1970.
15 Dec 70, 240p
Contract AT(04-3)-701

Descriptors: (*Snap reactors, *Control elements), Fuel elements, Performance testing, Reactor cores, Research programs, Safety, Shielding, Specifications, Stress analysis, S8dr reactor, Thermoelectric generators.

No abstract available.

COO-2155-15 PC$4.75/MF$2.25
Utah Univ., Salt Lake City.
Biomedical Engineering Support. Quarterly Progress Report, November 16, 1974--February 15, 1975.
W. J. Kolff, L. M. Smith, and G. M. Sandquist.
1975, 32p
Contract E(11-1)-2155

Descriptors: (*Mechanical heart, *Research programs), Performance, Plutonium 238, Radioisotope heat sources, Stirling cycle.

No abstract available.

DPST-75-128-4 PC$4.25/MF$2.25
Du Pont de Nemours (E.I.) and Co., Aiken, S.C. Savannah River Lab.
Exp 238 Pu Fuel Form Processes. Savannah River Laboratory Monthly Report.
Apr 75, 25p
Contract AT(07-2)-1

Descriptors: (*Plutonium 238, Radioisotope heat sources), (*Radioisotope heat sources, *Research programs), Fabrication, Savannah river plant.

No abstract available.

HIT-321 PC$4.75/MF$2.25
Hittman Associates, Inc., Columbia, Md.
Venting Helium from Encapsulated alpha-Emitting Radioisotope Heat Sources.
Jun 68, 34p

Descriptors: (*Radioisotope heat sources, *Research programs), Capsules, Helium, Leak testing, Materials, Permeability, Platinum, Plutonium oxides, Vents, Zircon, Zirconium oxides.

No abstract available.

MND-3607-131-1 PC$6.00/MF$2.25
Martin Marietta Corp., Baltimore, Md.
Evaluation Summary of a Snap Power System for Dodge-M Satellite.
Feb 67, 60p

Descriptors: (*Satellites, Spacecraft power supplies), (*Spacecraft power supplies, Snap 19 battery), (*Snap 19 battery, *Design), Fabrication, Operation, Performance, Planning, Reentry, Safety, Testing, Transport.

For abstract, see NSA 32 03, number 06369.

MND-3607-239-2 PC$12.25/MF$2.25
Martin Marietta Corp., Baltimore, Md.
Snap 19, Phase III. Volume II. Heat Sources. Final Report.
May 68, 181p
Contract AT(30-1)-3607

Descriptors: (*Snap 19 battery, Radioisotope heat sources), (*Radioisotope heat sources, *Research programs), (*Plutonium 238, Radioisotope heat sources), Capsules, Design, Fabrication, Plutonium oxides, Reentry, Space flight, Testing.

No abstract available.

NAA-SR-12450 PC$7.75/MF$2.25
Radio Corp. of America, Harrison, N.J.
Advanced Thermoelectric Program: Module Fabrication Development. Summary Report.
30 Sep 67, 95p

Descriptors: (*S10fs-1 reactor, *Thermoelectric generators), Materials testing, Research programs, Thermoelectric properties.

For abstract, see NSA 32 03, number 08114.

RN-PA-0001(Rev.A) PC$4.75/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Clustering of Nuclear Engines.
Oct 65, 35p

Descriptors: (*Nerva reactor, *Design), Comparative evaluations, Shielding.

For abstract, see NSA 32 03, number 08115.

RN-PA-0028(V.2) PC$8.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Westinghouse Astronuclear Laboratory Material Presented to Snpo in Shielding Trade Study Review.
M. A. Capo. 12 Dec 69, 113p

Descriptors: (*Nerva reactor, *Shielding), Comparative evaluations, Computer calculations, Design, Radiation doses.

For abstract, see NSA 32 03, number 08116.

RN-S-0091 PC$6.00/MF$2.25
Aerojet-General Corp., Azusa, Calif.
Basic Analog Model for the Nerva Engine.
May 64, 56p

Descriptors: (*Nerva reactor, *Mathematical models), Analog systems.

For abstract, see NSA 32 03, number 08117.

RN-S-0115 PC$19.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Data Analysis Report of Nrx-A1 Tests.
Jul 64, 329p

Descriptors: (*Nrx-a1 reactor, *Mathematical models), Asymmetry, Computer calculations, Fluid flow, Nozzles, Two-phase flow.

For abstract, see NSA 32 03, number 08118.

RN-S-0140 PC$6.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Preliminary Evaluation of Nuclear Hazards Associated with Orbital Start of a Nuclear Rocket Engine.
Sep 64, 67p

Descriptors: (*Nerva reactor, Space flight), (*Space flight, *Radiation hazards), Fragmentation, Reentry.

For abstract, see NSA 32 03, number 08119.

RN-S-0148(Rev.2) PC$12.25/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Test Plan for Cold Flow Development Test System. Second Revision.
Sep 64, 184p

Descriptors: (*Xe-prime reactor, *Test facilities), (*Reactor start-up, *Simulation), Mockup, Nerva reactor, Planning.

For abstract, see NSA 32 03, number 08120.

RN-S-0198 PC$10.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Minutes of the Fourth Quarterly Nerva Instrumentation Meeting.
Dec 64, 137p

Descriptors: (*Nerva reactor, *Reactor instrumentation), (*Nrx-a2 reactor, Reactor instrumentation), Temperature measurement, Thermocouples.

For abstract, see NSA 32 03, number 08121.

RN-S-0210 PC$13.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Final Test Report for Phase One of the Countermeasure Radiation Effects Program.
Apr 65, 197p

Descriptors: (*Nerva reactor, *Fragmentation), (*Chemical explosives, *Radiation effects), Getr reactor, Radiation doses.

For abstract, see NSA 32 03, number 08122.

RN-S-0283 PC$8.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Common Analog Model for Nrx/Est.
Jul 66, 109p

Descriptors: (*Nrx-a4-est reactor, *Mathematical models), Analog systems.

For abstract, see NSA 32 03, number 08123.

RN-S-0289 PC$16.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Xe-Engine Systems Analysis Design Data Book.
Aug 66, 269p

Descriptors: (*Xe-prime reactor, *Mathematical models), Computer calculations, Design.

For abstract, see NSA 32 03, number 08124.

RN-S-0320 PC$10.25/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Nrx-A5 Performance-Analysis Data Book.
Sep 66, 142p

Descriptors: (*Nrx-a5 reactor, *Performance testing), Planning.

For abstract, see NSA 32 03, number 08125.

RN-S-0328 PC$7.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Xe/Ets-1 Interaction Studies Status Report.
78p

Descriptors: (*Xe-prime reactor, *Test facilities), After-heat removal, Interfaces.

For abstract, see NSA 32 03, number 08126.

RN-S-0490 PC$14.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif. Nuclear Div.
75K Nerva Engine Systems Analysis Design Data Book.
D. L. Petite. Dec 68, 227p

Descriptors: (*Nerva reactor, *Computer calculations), Data, Design, Transients.

For abstract, see NSA 32 03, number 08127.

RN-TM-0143 PC$5.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Tube Wall Temperature Evaluation Program. Summary to Date.
R. E. Rice. 3 Dec 64, 37p

Descriptors: (*Nerva reactor, Nozzles), (*Nozzles, *Cooling), Correlations, Functional models, Heat transfer, Temperature measurement.

For abstract, see NSA 32 03, number 08128.

RN-TM-0179 PC$5.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Nerva Xe-Engine Shield Design Description.
E. A. Warman. Apr 65, 49p

Descriptors: (*Xe-prime reactor, *Shielding), Design, Radiation doses, Radiation streaming.

For abstract, see NSA 32 03, number 08129.

TID/SNA-1772 PC$13.25/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Turbopump Part Reliability Allocation.
E. K. Bair. 28 Sep 71, 202p

Descriptors: (*Nerva reactor, Pumps), (*Pumps, *Reliability), Failure mode analysis.

For abstract, see NSA 32 03, number 08130.

TID/SNA-1859 PC$7.75/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Photograph File: Adapter (Injector to Nozzle); Kiwi Adapters, S/N 001K and 002K; Nerva Adapters, S/N 001N, 002N, and 003N.
92p

Descriptors: (*Nerva reactor, *Nozzles), Destructive testing, Fires.

For abstract, see NSA 32 03, number 08131.

TID/SNA-1860 PC$5.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Miscellaneous Photographs.
37p

Descriptors: (*Nerva reactor, *Reactor components).

For abstract, see NSA 32 03, number 08132.

TID/SNA-1867 PC$19.75/MF$2.25
Aerojet-General Corp., Sacramento, Calif. Nuclear Div.
Nerva Reliability Program Summary. Technical Discussion.
Jan 70, 334p

Descriptors: (*Nerva reactor, *Reliability), Failure mode analysis, Planning, Reactor components, Valves.

For abstract, see NSA 32 03, number 08133.

TID/SNA-1871 PC$20.75/MF$2.25
Aerojet Nuclear Systems Co., Sacramento, Calif.
Nerva Reliability Program Summary, Technical Discussion.
May 70, 355p

Descriptors: (*Nerva reactor, *Reliability), Failures, Management, Reactor components, Research programs.

No abstract available.

TID/SNA-1873 PC$16.00/MF$2.25
Aerojet Nuclear Systems Co., Sacramento, Calif.
Preliminary Nerva Engine System Failure Mode, Effects and Criticality Analysis.
1970, 259p

Descriptors: (*Nerva reactor, Reactor components), (*Reactor components, *Failure mode analysis), Actuators, Nozzles, Pressure vessels, Pumps, Valves.

For abstract, see NSA 32 03, number 08135.

TID/SNA-1876 PC$13.50/MF$2.25
Aerojet Nuclear Systems Co., Sacramento, Calif.
Redundant Seal and Clamp for the Nerva Nozzle to Reflector Interface Joint.
22 Sep 70, 207p

Descriptors: (*Nerva reactor, *Joints), Design, Interfaces, Neutron reflectors, Nozzles, Seals.

For abstract, see NSA 32 03, number 08136.

TID/SNA-1942 PC$4.00/MF$2.25
Aerojet Nuclear Systems Co., Sacramento, Calif.
Engineering Operations Report: Evaluation of Thermal Network Solutions Available with the Sinda Computer Code.
J. D. Mockenhaupt. 29 Jul 71, 16p

Descriptors: (*Nerva reactor, Nozzles), (*Computer codes, *S codes), (*Nozzles, *Thermal analysis), Transients.

For abstract, see NSA 32 03, number 08137.

TID/SNA-1943 PC$4.75/MF$2.25
Aerojet Nuclear Systems Co., Sacramento, Calif.
Engineering Operations Report: Nozzle--Nozzle Extension Joint Concept No. 30 Stress Analysis.
J. G. Schumacher. 1 Mar 72, 34p

Descriptors: (*Nerva reactor, Nozzles), (*Nozzles, *Stress analysis), Design.

For abstract, see NSA 32 03, number 08138.

TID/SNA-2272 PC$30.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Nerva Program. Instrumentation Data Book.
1965, 537p

Descriptors: (*Nerva reactor, Thermocouples), (*Thermocouples, *Specifications), Inspection, Testing.

For abstract, see NSA 32 03, number 08140.

WANL-PR(J)-037 PC$12.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Westinghouse Astronuclear Laboratory Nerva Nuclear Subsystem. Progress Report, 1 January 1965--31 March 1965.
25 Apr 65, 192p

Descriptors: (*Nrx-a3 reactor, *Planning), (*Nrx-a4-est reactor, Planning), (*Xe-prime reactor, Planning), (*Nrx-a5 reactor, Planning), Corrosion, Fuel elements.

No abstract available.

WANL-PR(J)-039 PC$9.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Westinghouse Astronuclear Laboratory Nerva Nuclear Subsystem. Summary Progress Report, 1 October 1964--30 September 1965.
22 Oct 65, 128p

Descriptors: (*Nerva reactor, *Planning), (*Nrx-a3 reactor, *Performance testing), (*Nrx-a4-est reactor, *Fabrication), (*Nrx-a5 reactor, Fabrication), Design, Nrx-a6 reactor, Radiation effects, Stress analysis, Transfer functions, Xe-prime reactor.

No abstract available.

WANL-TME-1227 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Compressive Mechanical Properties of Fuel Elements at Elevated Temperatures.
L. T. Gesinski. Sep 65, 14p

Descriptors: (*Nerva reactor, Fuel elements), (*Fuel elements, *Mechanical properties), Testing, Very high temperature.

For abstract, see NSA 32 03, number 08154.

WANL-TME-1242 PC$4.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Core Insulation Thermal Test.
K. P. Kiefer. Aug 65, 26p

Descriptors: (*Nerva reactor, Thermal insulation), (*Thermal insulation, *Performance testing), Reactor cores.

For abstract, see NSA 32 03, number 08155.

WANL-TME-1300 PC$6.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nerva II Shield Conceptual Design Study.
Sep 65, 58p

Descriptors: (*Nerva reactor, *Shields), Computer calculations, Design, Radiation doses, Radiation heating, Shielding.

For abstract, see NSA 32 03, number 08156.

WANL-TME-1313 PC$5.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx-A6 Fuel Development Program.
A. Boltax. Oct 65, 37p

Descriptors: (*Nrx-a6 reactor, *Fuel elements), Coated fuel particles, Coatings, Corrosion, Hydrogen, Niobium carbides, Permeability, Pyrolytic carbon, Research programs.

For abstract, see NSA 32 03, number 08157.

WANL-TME-1318 PC$4.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Notes of Monthly Development Test Program Review Meeting Held with Snpo at Wanl on October 22, 1965.
12 Nov 65, 34p

Descriptors: (*Nerva reactor, *Reactor components), Testing.

No abstract available.

WANL-TME-1329 PC$5.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
A. Fuel Particle Evaluation and Coating Development. B. Experimental Investigation of Fission Product Release.
A. L. Feild, Jr, and G. L. Grandy. 19 Nov 65, 51p

Descriptors: (*Nerva reactor, Coated fuel particles), (*Coated fuel particles, *Coatings), Additives, Electron microscopy, Electron probes, Fission product release, Metallography, Pyrolytic carbon, Uranium carbides.

For abstract, see NSA 32 03, number 08159.

WANL-TME-1330 PC$8.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Hht-7 Test Report No. 2.
P. Cherish, and W. Painter. Jan 66, 113p

Descriptors: (*Nerva reactor, *Reactor cores), (*Graphite, *Corrosion), Reactor materials, Research programs.

For abstract, see NSA 32 03, number 08160.

WANL-TME-1373 PC$5.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Engineering Mechanics Laboratory Testing of Core Support Block. Progress Report.
E. A. Watjen, and N. P. Spofford. Feb 66, 41p

Descriptors: (*Nerva reactor, Reactor cores), (*Reactor cores, *Supports), Testing.

No abstract available.

WANL-TME-1377 PC$6.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Evaluation of New Graphites for Nerva Support Blocks.
V. Kachur. 59p

Descriptors: (*Nerva reactor, *Supports), (*Graphite, *Coatings), Mechanical properties, Niobium carbides.

For abstract, see NSA 32 03, number 08162.

WANL-TME-1379 PC$5.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx Reactor Design Presentation.
9 Feb 66, 49p

Descriptors: (*Nrx-a4-est reactor, *Fuel elements), (*Nrx-a5 reactor, *Design), (*Nrx-a6 reactor, Design), Corrosion.

For abstract, see NSA 32 03, number 08163.

WANL-TME-1382 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Friction and Wear Tests of Nrx-A5 Core Periphery Components.
L. P. Morgan. Feb 66, 16p

Descriptors: (*Nrx-a5 reactor, Reactor components), (*Reactor components, *Testing), Coatings, Friction, Graphite, Niobium carbides, Wear.

For abstract, see NSA 32 03, number 08164.

WANL-TME-1512 PC$5.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nerva Nuclear Self Destruct Safety Countermeasure.
D. W. Call. 30 Sep 66, 42p

Descriptors: (*Nerva reactor, *Fragmentation), Excursions, Fission product release, Fuel particles, Radiation protection, Ruptures.

For abstract, see NSA 32 03, number 08165.

WANL-TME-1540 PC$7.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Measurement of Fission Product Loss During Nrx-A5.
G. T. Rymer, W. A. Henninger, and G. L. Grandy. Dec 66, 95p

Descriptors: (*Nrx-a5 reactor, *Fission product release), Computer calculations, Corrosion, Errors, Fuel elements, Particle size, Radiation monitoring, Radioactive effluents, Radiometric analysis.

For abstract, see NSA 32 03, number 08166.

WANL-TME-1551 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nr-1 Sizing Parameter Study.
F. D. Retallick. 2 Dec 66, 19p

Descriptors: (*Nerva reactor, *Design), Fuel elements, Planning.

For abstract, see NSA 32 03, number 08167.

WANL-TME-1552 PC$5.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Notes of Monthly Development Test Program Review Meeting Held with Snpo at Wanl on November 16, 1966.
Nov 68, 51p

Descriptors: (*Nrx-a6 reactor, Reactor components), (*Xe-prime reactor, Reactor components), (*Reactor components, *Testing), Fuel elements, Supports.

For abstract, see NSA 32 03, number 08168.

WANL-TME-158 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Estimated Power Requirements of the Reactor Control System.
W. R. Morris. 9 Oct 62, 2p

Descriptors: (*Nerva reactor, Reactor control systems), (*Reactor control systems, *Energy demand), Actuators, Power.

For abstract, see NSA 32 03, number 08143.

WANL-TME-1674 PC$16.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx-A6 Fuel Assessment Program. Report of Supplementary Phase-I Electrical Tests, Characterization of Nrx/Est and Nrx-A5 Elements. Phase I-2A, Phase I-2B, Phase I-2D, Phase I-4A.
J. C. Guzek. Sep 67, 263p

Descriptors: (*Nrx-a6 reactor, *Fuel elements), (*Nrx-a4-est reactor, Fuel elements), (*Nrx-a5 reactor, Fuel elements), Coatings, Corrosion, Test facilities, Testing.

For abstract, see NSA 32 03, number 08169.

WANL-TME-178 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Radiation Data Requirements at the E-MAD Facility.
A. J. Svasek. 26 Oct 62, 3p

Descriptors: (*Nerva reactor, Test facilities), (*Test facilities, *Radiation monitoring).

For abstract, see NSA 32 03, number 08144.

WANL-TME-1784 PC$4.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Metal Tube Bore Inserts.
E. L. Kochka. 23 Apr 68, 35p

Descriptors: (*Nerva reactor, Fuel elements), (*Fuel elements, *Lining processes), Corrosion, Molybdenum, Niobium.

For abstract, see NSA 32 03, number 08170.

WANL-TME-1797 PC$6.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Notes of Monthly Development Test Program Review Meeting Held with Snpo at Wanl on May 1, 1968.
20 May 68, 56p

Descriptors: (*Nrx-a6 reactor, *Fuel elements), Corrosion, Testing.

For abstract, see NSA 32 03, number 08171.

WANL-TME-1810 PC$5.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Radiochemical Analysis of Nrx-A6.
W. A. Henninger, G. T. Rymer, and J. Roesmer. Jun 68, 43p

Descriptors: (*Nrx-a6 reactor, *Fission product release), Fuel elements, Radiometric analysis.

For abstract, see NSA 32 03, number 08172.

WANL-TME-2749 PC$12.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Cooldown and Thrust Nulling Requirements. Trade Study No. 703/704. Data Item S-54.
Feb 71, 177p

Descriptors: (*Nerva reactor, *After-heat removal), Comparative evaluations.

For abstract, see NSA 32 03, number 08173.

WANL-TME-282 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Effect of Thermal Neutron Scattering Models on Power Distributions in Kiwi-Type Reactors.
C. A. Stevens, and W. C. McCune. Mar 63, 9p

Descriptors: (*Nerva reactor, *Power distribution), (*Thermal neutrons, *Scattering), Beryllium, Graphite, Mathematical models.

For abstract, see NSA 32 03, number 08145.

WANL-TME-291 PC$7.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx-a Configuration for Radiation Analysis.
M. A. Capo, R. N. Nassano, and R. G. Saltesz. Apr 63, 90p

Descriptors: (*Nerva reactor, *Shielding), Computer calculations, Configuration, Radiation transport.

For abstract, see NSA 32 03, number 08146.

WANL-TME-428 PC$4.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Resonant and Shock Response Characteristics of the Nrx-a Lateral Support System.
P. A. Stancampiano. 15 Jul 63, 24p

Descriptors: (*Nerva reactor, Reactor cores), (*Reactor cores, *Impact shock), Friction, Mechanical vibrations, Resonance, Supports.

For abstract, see NSA 32 03, number 08147.

WANL-TME-429 PC$6.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Preliminary Analysis of Flow Oscillations and AERO-Elastic Vibrations in the Kiwi B-4A Reactor.
C. A. Bodenschatz, E. A. DeZubay, and H. L. Morrison. Jul 63, 70p

Descriptors: (*Kiwi-b4a reactor, *Mechanical vibrations), Fluid flow, Fuel elements, Mathematical models, Oscillations, Resonance, Two-phase flow.

For abstract, see NSA 32 03, number 08148.

WANL-TME-587 PC$6.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx-A1 and Nrx-A2 Instrumentation Accuracy Requirements.
A. M. Vetere, and E. J. Wisniewski. Oct 63, 57p

Descriptors: (*Nrx-a1 reactor, *Reactor instrumentation), (*Nrx-a2 reactor, Reactor instrumentation), Accuracy.

For abstract, see NSA 32 03, number 08149.

WANL-TME-671 PC$5.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Evaluation and Testing of Strain Gage Techniques Used in the Nrx-A1 Reactor.
T. A. Pappas, and H. P. Kalapaca. 12 Feb 64, 40p

Descriptors: (*Nrx-a1 reactor, *Strain gages), Adhesives, Testing.

For abstract, see NSA 32 03, number 08150.

WANL-TME-718 PC$6.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Information for Nerva Technical Committee Meeting of March 12, 1964.
18 Mar 64, 57p

Descriptors: (*Nerva reactor, Reactor components), (*Reactor components, *Testing), (*Graphite, *Wear), Corrosion, Fuel elements, Impact shock, Mechanical vibrations, Quality control, Seals, Supports, Temperature gradients, Thermal shock.

For abstract, see NSA 32 03, number 08151.

WANL-TME-797 PC$4.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Analysis of Several Nrx System Malfunctions.
J. D. Cleary. May 64, 21p

Descriptors: (*Nerva reactor, *Reactor safety), Safety, Test facilities.

For abstract, see NSA 32 03, number 08152.

WANL-TME-799 PC$5.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Status Report on Nrx Systems Analysis Models.
R. E. Thompson. 27 May 64, 39p

Descriptors: (*Nerva reactor, *Mathematical models), Computer calculations.

For abstract, see NSA 32 03, number 08153.

WANL-TMI-1038 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Calculation of Differential and Integral Absorption in Control Vane from Cmc Flux Values on and in Vane.
D. W. Drawbaugh. 16 Apr 64, 7p

Descriptors: (*Nerva reactor, *Control elements), Absorption, Neutron flux.

For abstract, see NSA 32 03, number 08190.

WANL-TMI-243 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Operating Instructions for Two IBM Programs for Tri-Axial Elastic Thermal Stresses.
I. N. Kallin. 20 Oct 62, 19p

Descriptors: (*Nerva reactor, Reactor components), (*Reactor components, *Thermal stresses), Computer calculations.

For abstract, see NSA 32 03, number 08174.

WANL-TMI-257 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Effects of Temperature on a Kiwi B-5 Shield Capsule Plugged with Magnesium Oxide.
J. J. Schreiber. 19 Sep 62, 4p

Descriptors: (*Nerva reactor, *Reactor materials), (*Lithium hydrides, *Compatibility), (*Magnesium oxides, Compatibility), High temperature.

For abstract, see NSA 32 03, number 08175.

WANL-TMI-258 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Bellows Seal, Kiwi B-5 Shield.
J. J. Schreiber. 19 Sep 62, 7p

Descriptors: (*Nerva reactor, Seals), (*Seals, *Testing), Bellows.

For abstract, see NSA 32 03, number 08176.

WANL-TMI-259 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
1.5% Boron, Stainless Steel.
J. J. Schreiber. 19 Sep 62, 12p

Descriptors: (*Nerva reactor, *Shielding), (*Stainless steels, *Fracture properties), Boron additions, Low temperature, Medium temperature.

For abstract, see NSA 32 03, number 08177.

WANL-TMI-267 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Request for Hot Cell Services.
H. W. Calley. 21 Sep 62, 9p

Descriptors: (*Nerva reactor, Bearings), (*Bearings, *Inspection), Hot cells.

For abstract, see NSA 32 03, number 08178.

WANL-TMI-268 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Wanl Pulse Pre-Amplifier.
E. J. Obusek. 21 Sep 62, 7p

Descriptors: (*Nerva reactor, *Reactor instrumentation), Preamplifiers, Pulse techniques.

For abstract, see NSA 32 03, number 08179.

WANL-TMI-269 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Capsule Thermal Shock Test.
J. J. Schreiber. 21 Sep 62, 1p

Descriptors: (*Nerva reactor, *Shields), Lithium hydrides, Testing, Thermal shock.

For abstract, see NSA 32 03, number 08180.

WANL-TMI-762 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Seal Segment Vibration Test.
G. Zibritosky, and D. Morin. 6 Aug 63, 4p

Descriptors: (*Nerva reactor, Seals), (*Seals, *Wear), Supports, Testing.

For abstract, see NSA 32 03, number 08181.

WANL-TMI-766 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Lateral Support Machine Screw Torque Test.
L. E. Parsons. 12 Aug 63, 13p

Descriptors: (*Nerva reactor, *Fasteners), Graphite, Testing, Torque.

For abstract, see NSA 32 03, number 08182.

WANL-TMI-772 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Fcx Element Load Test.
G. Zibritosky, and R. Lancaster. 15 Aug 63, 3p

Descriptors: (*Nerva reactor, Fuel elements), (*Fuel elements, *Testing), Nuclear facilities.

For abstract, see NSA 32 03, number 08183.

WANL-TMI-789 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Pressure Relief Holes in Nozzle End of Inner Reflector.
A. I. Miller. 3 Sep 63, 1p

Descriptors: (*Nerva reactor, *Neutron reflectors), Design, Openings, Pressure control.

For abstract, see NSA 32 03, number 08184.

WANL-TMI-790 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Viscous Compressible Fluid Flow in a Network of Narrow Channels.
P. C. Warner. 4 Sep 63, 7p

Descriptors: (*Nerva reactor, Fuel channels), (*Fuel channels, *Fluid flow), Shear.

For abstract, see NSA 32 03, number 08185.

WANL-TMI-793 PC$5.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Proposed Effluent Monitoring Program for Nrx Reactor Tests.
H. W. Calley. 30 Sep 63, 39p

Descriptors: (*Nerva reactor, Radioactive effluents), (*Radioactive effluents, *Radiation monitoring), Meteorology, Performance testing, Radiation hazards, Radioactive wastes, Test facilities.

For abstract, see NSA 32 03, number 08186.

WANL-TMI-804 PC$4.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Core Orificing Program Data Requirements.
A. H. Killinger. 20 Sep 63, 34p

Descriptors: (*Nerva reactor, Fuel channels), (*Fuel channels, *Orifices), Computer calculations, Reactor cores.

For abstract, see NSA 32 03, number 08187.

WANL-TMI-823 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Test Cell "A" Turbo-Pump Temperature.
W. K. Brunot. 2 Oct 63, 2p

Descriptors: (*Nerva reactor, *Pumps), Test facilities, Very low temperature.

For abstract, see NSA 32 03, number 08188.

WANL-TMI-832 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Load Vs. Deflection Characteristics for Instrumented and Non-Instrumented Lateral Support Springs.
14 Oct 63, 7p

Descriptors: (*Nerva reactor, Springs), (*Springs, *Testing), Fatigue.

For abstract, see NSA 32 03, number 08189.

WANL-TNR-042 PC$4.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Mode of Failure Analysis Summary. Nerva B-2 Reactor.
R. A. Neal. 9 Mar 62, 35p

Descriptors: (*Nerva reactor, *Failure mode analysis), Design, Reliability.

For abstract, see NSA 32 03, number 08191.

WANL-TNR-050 PC$10.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Advanced Reactor Study, Phase 1: Nerva Nuclear Subsystem.
Mar 62, 144p

Descriptors: (*Nerva reactor, *Design), Comparative evaluations, Kiwi-b4a reactor.

For abstract, see NSA 32 03, number 08192.

WANL-TNR-062(Pt.1) PC$4.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Laminar Flow Instabilities. Part I.
E. A. DeZubay. May 62, 23p

Descriptors: (*Nerva reactor, Laminar flow), (*Laminar flow, *Instability), Heat transfer, Thermodynamic properties.

For abstract, see NSA 32 03, number 08193.

WANL-TNR-078 PC$8.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Kiwi B-5 Shield. Volume III. Thermal Design and Analysis.
D. L. Black, and K. L. Rieke. 28 Dec 62, 109p

Descriptors: (*Nerva reactor, *Shields), Design, Shielding, Temperature gradients, Testing.

For abstract, see NSA 32 03, number 08194.

WANL-TNR-107 PC$4.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Vibration Test of an Electro-Pneumatic Actuator, General Electric Model 7T-AG14-A01.
W. J. Snarponis, and F. A. Sipe. 8 May 63, 28p

Descriptors: (*Nerva reactor, Actuators), (*Actuators, *Performance testing), Electric controllers, Mechanical vibrations, Pneumatic controllers, Resonance.

For abstract, see NSA 32 03, number 08195.

WANL-TNR-115 PC$10.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Assembly Procedures, Nrx-A1.
A. Zwillich. Jun 63, 141p

Descriptors: (*Nrx-a1 reactor, *Fabrication), Manuals, Specifications.

For abstract, see NSA 32 03, number 08196.

WANL-TNR-132 PC$5.75/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Fuel Element Binder Studies.
F. Yeoman, and A. Boltax. 20 Sep 63, 52p

Descriptors: (*Nerva reactor, Fuel elements), (*Fuel elements, *Binders), Research programs, Resins, Testing.

For abstract, see NSA 32 03, number 08197.

WANL-TNR-160 PC$4.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Evaluation of a Manufacturing Process for Producing Pyrolytic Graphite Insulating Sleeve of Maximum Structural Integrity.
J. S. Blay. 1964, 24p

Descriptors: (*Nerva reactor, *Thermal insulation), (*Pyrolytic carbon, *Fabrication).

For abstract, see NSA 32 03, number 08198.

WANL-TNR-178 PC$10.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nerva Source Term Program.
W. S. Brown. Sep 64, 141p

Descriptors: (*Nerva reactor, *Radiation hazards), Computer calculations, Fission products, Fragmentation, Radiation doses, Reactor accidents, Reentry.

For abstract, see NSA 32 03, number 08199.

WANL-TNR-219 PC$32.50/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Nrx-A5 Reactor Test Analysis Report.
W. L. Knecht. Mar 67, 588p

Descriptors: (*Nrx-a5 reactor, *Performance testing), Control rod worths, Corrosion, Fuel elements, Radiation doses, Radiation heating, Reactivity, Reactor start-up.

For abstract, see NSA 32 03, number 08200.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-A013 577/2GA PC$7.50/MF$2.25
Calspan Corp Buffalo N Y
Propellant Ignition and Combustion in the 155mm Howitzer.
Final rept. May-Dec 74,
E. B. Fisher, and K. W. Graves. Jan 75, 243p
Rept no. CALSPAN-VQ-5524-D-2
Contract DAAA21-74-C-0401
See also report dated Mar 74, AD-778 774.

Descriptors: *Howitzers, *Gun propellants, Combustion, Ignition, Interior ballistics, Propellant grains, Mathematical models, Computer programs, FORTRAN.
Identifiers: M-123 propelling charges, XM-123 propelling charges, M-198 howitzers(155-MM), XM-198 howitzers(155-MM), FORTRAN 4 programming language, Sensitivity analysis.

A mathematical model has been formulated and programmed in FORTRAN 4 for use in the propellant charge design and investigation of the performance anomalies for the 155mm howitzer. The model solves the unsteady gas dynamic equations for conservation of mass,

momentum, and energy by finite differencing simultaneously with auxiliary expressions for such important features as gas generation, bed friction, barrle boundary layer development, and projectile acceleration, until the projectile leaves the muzzle. This report details the mathematical concepts and experimental results that were incorporated into modifications of an existing mathematical model (for the 175mm gun) from which the 155mm howitzer model is derived.

AD-A013 595/4GA PC$3.75/MF$2.25
Naval Surface Weapons Center White Oak Lab Silver Spring Md
Investigation of Techniques to Reduce Electrostatic Discharge Susceptibility of Hermetically Sealed EEDS.
Technical rept.,
Howard S. Leopold, and Louis A. Rosenthal. 3 Jul 75, 41p Rept no. NSWC/WOL/TR-75-57

Descriptors: *Explosives initiators, *Electrostatics, Premature functioning(Ordnance), Detonators, Costs, Safety, Discharge, Hermetic seals, Sensitivity, Protective coatings, Chips(Electronics), Layers, Semiconductor diodes.
Identifiers: Mark-57 detonators, *Electrostatic discharge, Susceptibility.

Ten different techniques were investigated to increase the safety of hermetically sealed Navy EEDs to human electrostatic discharge. The application of a conductive coating containing carbon particles was found to be the simplest and least expensive of the techniques explored. The coating can protect the EED from repeated discharges and can withstand four weeks of exposure to MIL-STD-331 Test 105.1 with no deterioration.

AD-A013 795/0GA PC$5.75/MF$2.25
Arnold Engineering Development Center Arnold Air Force Station Tenn
Experimental Magnus and Static Stability Characteristics of Ballistic Projectiles with Various Boattail Angles and Lengths at Mach Numbers from 0.5 Through 2.5.
Final rept.,
Leroy M. Jenke, and T. O. Shadow. Aug 75, 129p Rept no. AEDC-TR-75-40 AFATL-TR-75-52
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-PWT-TR-75-12.

Descriptors: *Spin stabilized ammunition, *Aerodynamic characteristics, Magnus effect, Wind tunnel tests, Ballistics, Static stability, Boattail afterbodies, Moments, Force(Mechanics), Angle of attack, Subsonic characteristics, Transonic characteristics, Supersonic characteristics, Model tests, Test methods, Geometric forms.

An experimental investigation was conducted to determine the effect of boattail angle, boattail length, and base diameter on the Magnus-force and moment characteristics of spin-stabilized projectiles. The models were tested at Mach numbers from 0.5 through 1.3 over an angle-of-attack range from -2 to 8 deg. Data were obtained for a range of Reynolds numbers and for several spin parameter values. Results of this test, as well as results for Mach numbers 1.5, 2.0, and 2.5 from previous tests, are presented showing the effects of Mach number, angle of attack, spin rate, and boattail geometry.

AD-A013 812/3GA PC$4.25/MF$2.25
Franklin Inst Research Labs Philadelphia Pa
Determination of the Electrical Properties of M9 Propellant.
Final rept.,
Charles T. Davey. May 75, 63p Rept no. FIRL-F-C3854
Contract DAAA21-74-C-0317

Descriptors: *Gun propellants, Electrical properties, Static electricity, Electrostatic charge, Propellant grains, Sensitivity.
Identifiers: M-9 propellants.

Electrical properties of M-9 propellant were examined with varying temperature, humidity, density, particle size and electrical excitation. Main interest was in potential electrostatic problems in processing, handling and loading this propellant. Conductivity, dielectric constant, breakdown strength, and sensitivity were studied.

AD-A013 827/1GA PC$3.25/MF$2.25
Frankford Arsenal Philadelphia Pa
Spectrophotometric Determination of Bismuth in Copper and Cartridge Brass by the Iodide Method.
Technical test rept.,
George Norwitz, and Michael Galan. Jun 75, 17p Rept no. FA-TT-75043

Descriptors: *Cartridge cases, *Metallurgy, Quantitative analysis, Spectrophotometry, Bismuth, Copper alloys, Brass, Iodides.

An improved spectrophotometric method using iodide was developed for the determination of trace amounts of bismuth in copper and cartridge brass. In the method, the sample (25 g for copper and 10 g for cartridge brass) is dissolved in nitric acid and the bismuth is separated from the copper by an ammoniacal precipitation in the presence of ferric hydroxide as a gathering agent. The hydroxide precipitate is dissolved in hydrochloric acid, 2 ml of sulfuric acid is added, the solution is evaporated to a few ml, hydrobromic acid is added to volatilize the antimony and tin, and the solution is evaporated to fumes of sulfuric acid. The bismuth is then determined by the iodide color after adding a composite potassium iodide-sodium hypophosphite reagent. (Author)

AD-A013 832/1GA PC$3.25/MF$2.25
Harry Diamond Labs Adelphi Md
Inertial Impact Switches for Artillery Fuzes. Part III. Rocket Application.
Technical memo.,
G. Lucey, Jr., S. Clark, Jr., T. Zimmerman, and M. Ressler. Apr 75, 24p Rept no. HDL-TM-75-5
See also Part 1, AD-748 386.

Descriptors: *Rocket fuzes, *Impact fuzes, *Point detonating fuzes, Artillery rockets, Inertia, Arming devices, Loads(Forces), Vibration, Resonance, Accelerometers, Rotation, Rocket engines, Sputtering, Low costs.
Identifiers: FMU-98 fuzes, Rocket fins, Inertial switches.

An early function of the FMU-98 fuze mounted on the 2.75-in. rocket occurred approximately 0.1 sec after mechanical arming. Circumstantial evidence is documented that indicates the 600-G, Skinny inertial switch to be the cause. The theory is that the switch had a deformed gap and was excited into closure by rattling of the rocket fins and sputtering of the rocket motor. Although the evidence is not conclusive on the cause of the early function, a precautionary change to the less resonant, 600-G, low cost switch is recommended. (Author)

AD-A013 867/7GA PC$4.25/MF$2.25
Watervliet Arsenal N Y Benet Weapons Lab
Friction and Wear at High Sliding Speeds.
Technical rept.,
Robert S. Montgomery. Jun 75, 57p Rept no. WVT-TR-75028

Descriptors: *Rotating bands, *Wear resistance, *Friction, Steel, Projectiles, Gun barrels, High velocity, Sliding, Gun muzzles, Ablation, Heat resistant metals, Wear, Mechanical properties.

The wear of rotating band materials and projectile steel at very high sliding speeds is of great importance in the development of improved cannon. This is especially true for the large caliber, high muzzle velocity weapons where excess wear on the bore near the muzzle can limit their useful lives. An extensive experimental study by The Franklin Institute was supported by the Army from about 1946 to 1956 with a great deal of data collected at sliding speeds up to 1800 fps using a sophisticated high-speed-pin-on-disk test device. These data indicated that the mechanism of wear at high sliding speeds is surface melting followed by subsequent removal of a portion of the melted surface layer. This means that a rotating band material must be high melting if it is to have good wear resistance at high sliding speeds although, of course, wear can be decreased by design changes such as increased bearing area, etc. This does not mean, however, that compatibility, crystal structure, hardness, etc. have no effect because, for a short distance down the bore, the surface of the rotating bands is not completely melted. It could be that excessive bore wear near the muzzle actually is caused by severe wear of the rotating bands occurring near the origin-of-rifling in some cases. (Author)

AD-A013 868/5GA PC$4.25/MF$2.25
Watervliet Arsenal N Y Benet Weapons Lab
Cannon Muzzle Blast Noise Suppression Facility.
Technical rept.,
H. J. Sneck. Jul 75, 63p Rept no. WVT-TR-75043

Descriptors: *Noise reduction, *Simulators, *Guns, *Suppressors, Fluid mechanics, Flow fields, Mathematical models, Noise analyzers, Spectrum analyzers, Chambers, Blast, Water table, Shock waves, Hydraulic models.
Identifiers: Muzzle blasts, *Blast suppressors, Cannon blasts, Water table models, 115mm ordnance items, *Mufflers.

This report describes the theoretical and analytical investigation of a stationary noise suppressor for cannons. (1) A water table model was used to establish the basic suppressor configuration. Shock wave and lumped parameter mathematical models were used to analyze suppressor performance. A model 20mm suppressor was constructed, tested, and found to compare favorably with test results. A full scale suppressor (for 155mm gun) was designed on the basis of analysis and model tests; a simplified version was constructed and field tested. The simplified full scale suppressor successfully reduced the noise levels to acceptable values.

N75-26153/7GA PC$3.75/MF$2.25
Materials Research Labs., Maribyrnong (Australia).
Development of Fuze DA MK AN/2. Part 1: Mechanical Design and Testing.
R. C. Czigledy, and J. R. Bentley. Dec 74, 29p MRL-TN-355-PT-1

Descriptors: *Ammunition, *Fuses (Ordnance), Design analysis, Performance prediction, Structural analysis.

For abstract, STAR 1317

N75-26154/5GA PC$3.25/MF$2.25
Materials Research Labs., Maribyrnong (Australia).
The Stab Sensitising Action of Tetrazene.
R. Bird. Jan 75, 13p MRL-TN-362

Descriptors: *Explosives, *Ignition temperature, *Propellant sensitivity, *Stability tests, Detonators, Propellant additives, Propellant chemistry, Propellant combustion, Pyrotechnics.

For abstract, STAR 1317

PATENT-3 732 821 Not available NTIS
Department of the Army Washington D C
Nose Ogive for Nonlethal Projectile.
Patent,
Thurber W. Royer. Filed 25 May 71, patented 15 May 73, 6p Rept nos. PAT-APPL-146 767,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Riot control, *Projectiles, *Patents, Projectile caps, Polymers, Frangible, Energy absorbers.
Identifiers: PAT-CL-102-41.

The patent relates to a munition assembly comprising a primer, propellant, fuze, chemical agents positioned in a cartridge case and projectile. The projectile is fitted with a non-destructable polymeric impact-attenuating nose unit. The nose unit is designed to absorb the kinetic energy in the projectile to reducing the lethal potential of the projectile when fired and physically contacting personnel.

PATENT-3 732 824 Not available NTIS
Department of the Army Washington D C
Means for Converting Impulse Linear Acceleration to Rotational Inertia.
Patent,
Issai Lefkowitz, William J. Ralph, Donald R. Lenton, and Benjamin D. Nabreski. Filed 28 Apr 71, patented 15 May 73, 3p Rept nos. PAT-APPL-138 052,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Time fuzes, *Arming devices, *Patents, Rotors, Fluids, Silicones, Rotation.
Identifiers: PAT-CL-102-78.

The patent relates to a projectile timing fuze arrangement in which a rotatable arming element is driven by a rotor that contains fluid within a forward end of an internal spiral groove. Upon the rotor being subjected to impulse linear acceleration rotational motion will be imparted to the rotor.

PATENT-3 733 489 Not available NTIS
Department of the Army Washington D C
Radiation Timing Device.
Patent,
Sigmund Berk. Filed 7 Jul 71, patented 15 May 73, 5p Rept nos. PAT-APPL-160 287,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Timing devices, *Radiation measuring instruments, *Patents, Radiation monitors, Counters, Radioactive materials, Radioactive decay.
Identifiers: PAT-CL-250-83-3-R.

The patent relates to a radiation timing device for use in fuzes for bombs, shells, mines and the like. The constant emission of radioactive emanations from a radioactive source is used to measure time. The device consists of a source, a shutter or absorber placed between the source and a radiation detector and counter. When a predetermined number of emanations is counted a switch activates the device.

PATENT-3 734 983 Not available NTIS
Department of the Army Washington D C
Continuous Melt-Pour Process for High Explosives.
Patent,
Irving Forsten, Louis Jablansky, Colin B. Piper, and John J. Canavan. Filed 23 Aug 71, patented 22 May 73, 7p Rept nos. PAT-APPL-174 078,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *High explosives, *Manufacturing, *Patents, Production control, Melting, Processing equipment.
Identifiers: PAT-CL-264-3-C, *Continuous processing.

In the patent, a method and apparatus are provided for a novel continuous, automated melt-pour process for high explosives, such as TNT, wherein flaked high explosive is continuously introduced into a vessel containing an agitated pool of the molten explosive. This provides a high ratio of heating surface to volume of explosive and the molten explosive is continuously pumped to a remote shell loading station through a heated pipe system. This system is provided with detonation traps which prevent propagation of an explosion.

PATENT-3 738 278 Not available NTIS
Department of the Army Washington D C
Coloured Smoke Production.
Patent,
Wayne J. Bachusky, and Rodolphe J. Levesque. Filed 7 Jun 71, patented 12 Jun 73, 2p Rept nos. PAT-APPL-150 729,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Smoke generators, Pyrotechnics, Colors, Vanadium compounds, Oxychlorides, Formulations, Packaging.
Identifiers: PAT-CL-102-90, Vanadium/dichloro-oxo.

The invention provides a process for producing an intense, persistent coloured smoke, wherein a mixture of VOCl3 and a stabilizer, e.g. concentrated sodium hydroxide, which intensifies and prolongs the color of the smoke, is released into the atmosphere. Also provided is a packaged composition for providing such a smoke, which comprises a sealed frangible container containing a mixture of VOCl3 and a stabilizer of said type.

PATENT-3 744 418 Not available NTIS
Department of the Army Washington D C
Flares.
Patent,
Jesse F. Tyroler. Filed 3 Jun 71, patented 10 Jul 73, 5p Rept nos. PAT-APPL-149 489,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Parachute flares, *Patents, Pellets, Increments, Particle size, Burning rate.
Identifiers: PAT-CL-102-35-4.

The patent describes a flare which by incremental configuration provides a more or less constant level of illumination on the ground.

19C. Combat Vehicles

AD-A013 986/5GA PC$4.75/MF$2.25
Army Engineer Waterways Experiment Station Vicksburg Miss
Comparison of the Ride Qualities of Standard M60A1 and Hybrid (Tube-Over-Bar) M60A1E3 Tanks.
Final rept.,
Newell R. Murphy, Jr., and James H. Robinson. Jun 75, 81p Rept no. AEWES-Misc-Paper-M-75-5

Descriptors: *Tanks(Combat vehicles), *Ride quality, Shock mitigation, Suspension devices, Road tests, Dynamic tests, Vibration, Guns.
Identifiers: M-60 tanks, M-60A tanks.

The main objectives of the study were to determine the advantages in ride quality provided by the hybrid suspension configuration and to obtain better-quality terrain-limiting speeds for input to the DYNTACS computer model for combat effectiveness studies. Also investigated was the effect of the main gun position on ride quality and compare ride levels at the driver's seat with those at the tank commander's observation seat.

19D. Explosions, Ballistics, and Armor

AD-A013 634/1GA PC$3.75/MF$2.25
Department of Defense Explosives Safety Board Washington D C
Fragment and Debris Hazards.
Technical paper,
T. A. Zaker. Jul 75, 32p Rept no. DDESB-TP-12

Descriptors: *Ammunition, *Fragmentation, Projectile trajectories, Fragments, Ballistic trajectories, Detonations, Hazards, Debris.

Selected concepts involved in characterizing the hazards of fragment-producing ammunition are reviewed. Emphasis is placed on the effects from stores of ammunition which may detonate massively, such that the fragment field is potentially relatable to that from a single weapon detonated in isolation. Injury criteria in current use are compared, and a simple procedure for estimating injury probability as a function of distance from the explosion point is suggested.

AD-A013 642/4GA PC$4.75/MF$2.25
Naval Ordnance Lab White Oak Md
Computed and Experimental Hugoniots for Unreacted Porous High Explosives.
Final rept.,
John O. Erkman, and David J. Edwards. 31 Dec 74, 79p Rept no. NOLTR-74-213

Descriptors: *Explosives, *Shock tests, *TNT, Equations of state, Porous materials, Sensitivity, Numerical analysis, Mathematical models, Computer programs, FORTRAN.
Identifiers: *Hugoniot equation of state.

A knowledge of the Hugoniot of unreacted explosives is required to interpret transitional phenomena in explosives and to determine the shock sensitivity of explosives. The usual method employed to obtain the Hugoniot of a material is to perform a series of experiments which measure two of the following variables: shock velocity, particle velocity, pressure, and volume. However, there are drawbacks to this approach for porous (granular) explosives. Fortunately, computational methods have been developed which yield the Hugoniot of inert, porous materials when the Hugoniot of the non-porous material is known. If these computational methods can be applied to porous explosives, much work and expense can be saved. In this study, the authors have applied these computational methods to porous TNT for a range of densities from 1.60 to 0.98 g/cc. This method was confirmed by experimentally obtaining the Hugoniot for unreacted TNT at a density of 0.98 g/cc over the range of particle velocities of 0.350 - 1.720 mm/microsec and of pressures of 3.6 - 55.0 kbar.

AD-A013 864/4GA PC$5.25/MF$2.25
Drexel Univ Philadelphia Pa

MCDU-8-A Computer Code for One-Dimensional Blast Wave Problems.
Contract rept.,
Donald L. Tuckmantel, James Mao, and Pei Chi Chou. Jul 75, 109p Rept no. 72-8 BRL-CR-243
Contract DAAD05-70-C-0175

Descriptors: *Blast waves, *Method of characteristics, *Computer programs, *Coding, Shock waves, Wave propagation, Numerical analysis, Digital computers, Detonation waves, Pentolite, Spheres, Compressed air.
Identifiers: Computer codes, Rankine-hugoniot relations, Rankine Hugoniot method, Brinkley-Kirkwood theory, mcdu-8-A computer code. x

The method of characteristics computer code MCDU-8 which calculates solutions for one-dimensional blast wave problems is described. Since the code does not treat the detonation wave, it commences calculation when the detonation emerges from the charge surface. Subsequently, shocks are traced exactly using the Rankine-Hugoniot relations while continuous regions are calculated using the method of characteristics. Comparisons are presented between MCDU-8 solutions for spherical pentolite and other solutions and experiments. (Author)

AD-A013 981/6GA PC$3.75/MF$2.25
Frankford Arsenal Philadelphia Pa
Correlation Determinations between Stress Corrosion Characteristics of Wrought 7039 Aluminum Armor and Other Alloy Characteristics - Ballistic Performance, Yield Strength, and Electrical Conductivity.
Technical research rept.,
James V. Rinnovatore, Donald T. Rorabaugh, and Albert Zalcmann. Apr 75, 29p Rept no. FA-TR-75026

Descriptors: *Armor plate, Aluminum alloys, Stress corrosion, Resistance, Statistical analysis, Correlation techniques, Ballistic testing, Yield strength, Electrical conductivity.
Identifiers: Aluminum alloy 7039.

The study was performed to determine whether a correlation could be established between the stress corrosion resistance of wrought 7039-T6 aluminum armor plates and other alloy characteristics such as ballistic performance, yield strength, and electrical conductivity. A survey and statistical analysis were conducted on acceptance test data available for about 500 preproduction lots of 7039-T6 plates.

LA-5909-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Magnification Ratios for Explosive-Driven Shocks.
W. Fickett, and C. L. Mader. Apr 75, 4p
Contract W-7405-ENG-36

Descriptors: (*Shock waves, *Velocity), Distance, Explosives, Trajectories.

No abstract available.

N75-26001/8GA PC$3.75/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Trajectory Estimation of Hybrid Rocket Barbarellaeine Abschaetzung der Flugbahn der Hybridrakete 'Barbarella'.
W. M. Schauer. Apr 74, 34p TUM-LRT-KB-3
Language in German.

Descriptors: *Hybrid propellant rocket engines, *Missile trajectories, *Trajectory analysis, Aerodynamic drag, Angles (Geometry), Computer programs, Equations of motion, Estimating, Payload mass ratio, Propellant mass ratio, Rocket launchers, Thrust control.

For abstract, STAR 1317

N75-26152/9GA PC$3.25/MF$2.25
Materials Research Labs., Maribyrnong (Australia).
Theoretical Predictions of Thermal Explosions. Part 1: A Mathematical Model of a Bomb in a Fire.
D. B. Stroud. Feb 75, 21p REPT-623-PT-1

Descriptors: *Aerial explosions, *Bombs (Ordnance), *Fires, *Mathematical models, Aircraft fuels, Aircraft hazards, Conductive heat transfer, Fire fighting, Prediction analysis techniques, Thermal control coatings.

For abstract, STAR 1317

N75-26155/2GA PC$3.75/MF$2.25
Arbeitsgruppe fuer Ballistische Forschung, Weil am Rhein (West Germany).
Muzzle Fire Investigations Using a Powder Without Fire Attenuating Compounds Muendungsfeueruntersuchungen bei Verwendung Eines Pulvers Ohne Feuerdaempfungszusatz.
G. Klingenberg. Aug 74, 39p ABF-3/74
Language in German.

Descriptors: *Flame spectroscopy, *Gun propellants, *Gunfire, *Light (Visible radiation), *Rifles, Gas pressure, Propellant additives, Temperature measurement.

For abstract, STAR 1317

PATENT-3 743 006 Not available NTIS
Department of the Army Washington D C
Preparation of Beryllium Boride Armor by Direct Casting.
Patent,
Carl F. Cline, and Mark L. Wilkins. Filed 7 Feb 72, patented 3 Jul 73, 4p Rept nos. PAT-APPL-223 840,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Body armor, *Patents, Beryllium alloys, Casting, Cermets, Boron alloys, Borides.
Identifiers: Beryllium borides, PAT-CL-164-128.

The patent relates to a method of casting lightweight armor material of Be4B dispersed in a Be matrix comprising the melting of a mixture of Be4B and Be powder containing 10-20 atomic percent boron, cooling to induce a temperature gradient in the molten material, and recovering the solidified cermet.

SAND-75-5296 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Wind Damage to Windows as Estimated from Explosion Tests.
J. W. Reed. 1973, 4p CONF-750602-3

Descriptors: (*Windows, *Blast effects), (*Wind, *Hazards), Damage, Explosions, Failures, Shock waves.

For abstract, see NSA 32 03, number 06361.

19F. Guns

AD-A013 866/9GA PC$3.75/MF$2.25
Watervliet Arsenal N Y Benet Weapons Lab
Analysis of Wear Data for the 155mm XM198.
Technical rept.,
Richard G. Hasenbein. May 75, 31p Rept no. WVT-TR-75023

Descriptors: *Gun barrels, *Interior ballistics, Wear resistance, Erosion, Wear, Erosion resistance, Projectiles, Propelling charges, Howitzers, Stability, Alignment, Emplacement, Gun propellants, Gases, Leakage(Fluid), Rotating bands, Firing tests(Ordnance), Elastic properties.
Identifiers: XM-199 howitzers(155-mm), M-199 howitzers(155-mm), M-199 guns(155-mm), Imbalance, XM-199 guns(155-mm), XM-198 howitzers(155-mm), M-198 guns(155-mm), XM-198 guns(155-mm), M-198 howitzers(155-mm), M-549 projectiles(155-mm), M-123 propelling charges(155-mm), *Propellant gases escapement, Muzzle erosion, Muzzle wear.

This test attempts to determine which characteristics of tube or projectile cause or influence muzzle wear, particularly for the 155mm XM198 howitzer family of components (XM199 cannon, XM549 projectile, XM123 propelling charge). The test was limited to an evaluation of conditions which either are known or are suspected to have an impact on muzzle wear. The assumption was made that the extent of shell body engraving is directly proportional to the extent of muzzle wear. No single variable under observation was found which controls the presence of body engraving; it was concluded that a number of causes, perhaps in specific combinations, produce this effect. Several parameters were found, however, which increase either the incidence or the extent of body engraving including coppering, projectile seating as influenced by the forcing cone, dynamic instability, projectile imbalance, and escape of propellant gases ahead of the rotating band. Based solely on the results of this test, a hypothesis is proposed concerning the mechanism of muzzle wear. (Author)

PATENT-3 738 223 Not available NTIS
Department of the Army Washington D C
Obturator-Extractor Device for Firearms.
Patent,
John S. Post, and Frederick P. Reed. Filed 23 Nov 71, patented 12 Jun 73, 6p Rept nos. PAT-APPL-201 523,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cartridge case extractors, *Patents, Obturation(Ballistics), Gun components, Gun barrels, Extraction, Rifles.
Identifiers: PAT-CL-89-26.

The patent relates to an obturator-extractor which provides safe firing of cartridges having cases made from lightweight materials, such as aluminum, plastics, or other non-metallic materials, in a firearm with a reciprocating bolt. A single piece obturator-extractor device is mounted as a shell on the bolt head and is comprised of convexly formed surfaces which make sealing contact with the barrel chamber and a tubular section which is receivable by a recess formed in the head to receive the rear end of the case. An extractor of cantilever configuration is provided on the tubular section of the obturator for engagement with the extractor groove in the case.

PATENT-3 738 224 Not available NTIS
Department of the Army Washington D C
Obturated Firearm Breech Safety Device.
Patent,
John S. Post, and Frederick P. Reed. Filed 23 Nov 71, patented 12 Jun 73, 4p Rept nos. PAT-APPL-201 524,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Rifles, *Safety equipment, *Patents, Breech mechanisms, Gun components, Obturation(Ballistics), Gun barrels.

Identifiers: PAT-CL-89-26.

The patent relates to a device whereby in a firearm comprising a reciprocating bolt, the pin for retaining the extractor against rotation in the nose thereof is adapted to be blown radially from the firearm through a cooperating passage responsive to excessive gas pressure in the barrel for release thereof. In an alternate embodiment the tubular body of the extractor is thinned down where coincident with the inner mouth of the passageway so as to be rupturable by excessive gas pressure for release thereof through the passageway.

19G. Rockets

AD-A014 087/1GA PC$4.25/MF$2.25
Boston Univ Mass Engineering Labs
An Experimental Study of Aerodynamic Characteristics of Longitudinally Truncated Cylinders and Cone-Cylinders.
Rocco Girolamo. Jan 75, 73p Rept no.
Scientific-4 AFCRL-TR-75-0107
Contract F19628-71-C-0209
See also report dated Jun 73, AD-766 250.

Descriptors: *Sounding rockets, *Atmosphere entry, *Aerodynamic characteristics, Cylinders, Truncation, Payload, Stability, Conical bodies, Wind tunnel models, Wind tunnel tests, Supersonic drag, Recovery vehicles, Braking.
Identifiers: Drag increase.

An investigation has been conducted at the Boston University supersonic wind-tunnel testing facility to determine the aerodynamic characteristics of the payload sections of sounding rockets designed to increase drag during re-entry. The higher drag is desired in order to increase the vehicle's atmospheric braking during re-entry so that its velocity is reduced to M=2 at a much higher altitude than is ordinarily attained. This would allow earlier parachute deployment, thus increasing airborne time and facilitating mid-air recovery by aircraft.

19H. Underwater Ordnance

AD-A013 660/6GA PC$4.25/MF$2.25
Naval Postgraduate School Monterey Calif
Design Approach for a Computer Graphics System Applicable to Torpedo Tracking and Evaluation.
Master's thesis,
Lee Neal Schofield. Jun 75, 56p

Descriptors: *Tracking, *Computer graphics, *Torpedoes, *Interactive graphics, Data processing equipment, Display systems, Three dimensional, Real time, Programming languages, Subroutines, Theses, Machine coding.
Identifiers: Computer software, Design.

This paper presents a design approach and specific considerations for a dedicated, real time, interactive, computer graphics system to be used in the tracking and evaluation of torpedoes utilizing an input from a three-dimensional tracking range. The basic parameters for making output, software and hardware decisions are presented with alternative examples given in each area of the design process. (Author)

20. PHYSICS

20A. Acoustics

AD-A013 728/1GA PC$3.75/MF$2.25
Arnold Engineering Development Center Arnold Air Force Station Tenn
An Experimental Investigation of Techniques to Suppress Edgetones from Perforated Wind Tunnel Walls.
Final rept. 19 Sep 72-20 Dec 74,
N. S. Dougherty, Jr., C. F. Anderson, and R. L. Parker, Jr. Aug 75, 40p Rept no. AEDC-TR-75-88
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-PWT-TR-75-36.

Descriptors: *Aerodynamic noise, *Transonic wind tunnels, *Walls, Perforation, Noise reduction, Holes(Openings), Angles, Acoustic fields, Interactions, Experimental design, Feasibility studies.
Identifiers: Perforated walls, Edgetones.

The aerodynamic noise emitted by perforated walls in transonic wind tunnels has been under study for several years at AEDC. This report presents a summary of recent experimental tests to suppress perforated wall noise in transonic test sections. The mechanism of noise generation from perforated walls having 60-deg inclined holes is the edgetone phenomenon where the shear layer over each hole interacts with the trailing edge to produce intense tones at discrete frequencies. Noise reduction was achieved with several modified wall samples in the 6-in. tunnel at resonance conditions.

AD-A013 794/3GA PC$4.75/MF$2.25
Arnold Engineering Development Center Arnold Air Force Station Tenn
Jet Noise: A Survey and a Prediction for Subsonic Flows.
Final rept. Jul 73-Sep 74,
Philip T. Harsha. Aug 75, 78p Rept no. AEDC-TR-75-85
Prepared in cooperation with ARO, Inc., Tullahoma, Tenn. Rept. no. ARO-ETF-TR-74-115.

Descriptors: *Jet engine noise, *Aerodynamic noise, Jet plane noise, Acoustic fields, Turbulent flow, Flow fields, Kinetic energy, Noise pollution, Mathematical analysis.
Identifiers: *Aeroacoustics.

The state-of-the-art of the prediction of turbulent jet noise is surveyed. This survey includes a description of the available experimental data on subsonic and supersonic, cold and hot jets, and of present theoretical treatments of the mechanisms of turbulent jet noise production. A detailed analysis of the production of subsonic cold jet noise, based on the acoustic analogy formulation, is described, and results of computations using this analysis and a turbulent kinetic energy analysis of the jet flow field are presented and compared with representative experimental data.

AD-A014 003/8GA PC$4.75/MF$2.25
California Inst of Tech Pasadena Graduate Aeronautical Labs
Measurements of Radiated Noise in the Caltech High-Speed Water Tunnel. Part I. Radiated Noise from Turbulent Boundary Layers.
Final rept.,
Steven J. Barker. 30 Aug 74, 58p
Contract N00014-67-A-0094-0028
See also Part 2 dated 20 Mar 75, AD-A014 008.

Descriptors: *Hydrodynamics, *Noise(Sound), *Acoustic measurement, Test methods, Water tunnels, Turbulent boundary layer, Feasibility studies, Flow fields, Geometric forms, Boundary layer flow, Pressure distribution, Model tests, Hydrofoils.
Identifiers: *Hydrodynamic noise.

This report describes the final results of an experimental program conducted in the High-Speed Water Tunnel of the California Institute of Technology. The purpose of the investigation was to determine the feasibility of measuring hydrodynamic radiated noise in the water tunnel, and to measure the radiated noise for several simple flow geometries. The final report is divided into two parts, of which this is the first. It presents the results of noise measurements on fully wetted turbulent boundary layer flows. Part 2 will be concerned with measurements on cavitating flows. The noise intensity is much less in fully wetted flows than in cavitating flows, and hence the measurements described in Part 1 were much more difficult to make.

AD-A014 008/7GA PC$3.75/MF$2.25
California Inst of Tech Pasadena Graduate Aeronautical Labs
Measurements of Radiated Noise in the Caltech High-Speed Water Tunnel. Part II. Radiated Noise from Cavitating Hydrofoils.
Final rept.,
Steven J. Barker. 20 Mar 75, 46p
Contract N00014-67-A-0094-0028
See also Part 1 dated 30 Aug 74, AD-A014 003.

Descriptors: *Hydrodynamics, *Cavitation noise, *Acoustic measurement, Cavitation, Water tunnels, Test methods, Model tests, Hydrofoils, Velocity, Hydrodynamic configurations, Mathematical models, Wake, Blades, Vortices.
Identifiers: *Hydrodynamic noise, Trailing vortices.

This paper is the second part of a report on recent measurements of hydrodynamic noise in the Caltech High-Speed Water Tunnel. In the first part, results for noise radiated from fully wetted turbulent boundary layers were presented. In this part the results for cavitating flows are described. Because of the greater intensity of cavitation-produced noise, the signal to noise, ratio was much higher in these measurements than in the fully wetted case. Noise spectra were measured over a range of variations of flow velocity, cavitation number, and model configuration.

AD-A014 025/1GA PC$3.25/MF$2.25
Rosenstiel School of Marine and Atmospheric Science Miami Fla
Speed of Sound in Seawater as a Function of Temperature and Salinity at 1 atm,
Frank J. Millero, and Thomas Kubinski. 25 Jul 74, 8p
Contract N00014-67-A-0201-0013, Grant NSF-GA-40532
Availability: Pub. in Jnl. of the Acoustical Society of America, v57 n2 p312-319 Feb 75.

Descriptors: *Underwater sound, *Acoustic velocity, *Sea water, Temperature, Salinity, Equations of state, Mathematical models, Ocean models, Sound transmission, Velocimeters, Specific heat, Compressive properties, Reprints.

The speed of sound in standard seawater (diluted with pure water and evaporated) has been measured relative to pure water with a Nusonics velocimeter as a function of temperature (0 to 40 C, at 5 deg intervals) and salinity (5 to 40%, at 5% intervals) at 1 atm. An equation is proposed and the sound speeds fit this equation to a standard deviation of 0.04 m/sec over the entire temperature and salinity range.

COM-75-11083/3GA PC$3.25
Washington Univ., Seattle.
Comment on 'Level and Zero Crossing in Volume Reverberation Signals' (by R. C. Spindel, and P. T. McElroy. Pub. in Jnl. of Acoustical Society of America, v53 p1417-1426 1973),
John E. Ehrenberg, and Carl A. Erickson. 25 Nov 74, 5p WSG-TA-75-5 NOAA-75072218
Grant NOAA-04-3-158-42
Pub. in Jnl. of the Acoustical Society of America, v57 n4 p961-963 Apr 75.

Descriptors: *Acoustic scattering, *Reverberation, Stochastic processes, Random variables, Rayleigh scattering, Rayleigh waves.
Identifiers: Sea Grant program, Reprints.

Spindel and McElroy (J. Acoust. Soc. Am. 53, 1417-1426 (1973)) used the zero crossings of a reverberation process to obtain an estimate of the spatial density of scatterers. Errors in their analysis resulted in an intuitively incorrect relationship between the scattering density and the reverberation zero crossing and rate. The errors in their analysis are discussed, and, using a different approach, an intuitively correct expression for the zero crossing rate is derived for the special case of a rectangular sinusoidal transmitted pulse and Rayleigh distributed echo amplitudes.

ESDU-74001 PC$50.50
Engineering Sciences Data Unit Ltd., London (England).
An Introduction to Gas Turbine Exhaust Noise.
Data item.
Jun 73, 8p*
For information on availability of series, sub-series, and other individual data items, write NTIS, Attn: ESDU, Springfield, Va. 22161.

Descriptors: *Jet aircraft, *Gas turbines, *Exhaust systems, *Jet engine noise, Jet mixing flow, Turbulence, Noise(Sound), Nozzle flow, Far field, Graphic methods, User needs, Great Britain.
Identifiers: ESDU/N, *Exhaust noise, *Design engineering, *Engineering design data, *Shock noise.

The data item describes the various noise sources associated with gas turbine exhausts.

ESDU-74002 PC$74.50
Engineering Sciences Data Unit Ltd., London (England).
Estimation of Subsonic Far-Field Jet-Mixing Noise.
Data item.
Jun 73, 12p*
For information on availability of series, sub-series, and other individual data items, write NTIS, Attn: ESDU, Springfield, Va. 22161.

Descriptors: *Jet aircraft, *Gas turbines, *Convergent divergent nozzles, *Noise(Sound), Exhaust systems, Far field, Jet mixing flow, Nozzle flow, Graphic methods, User needs, Great Britain.
Identifiers: ESDU/N, *Exhaust noise, *Design engineering, *Engineering design data, *Shock noise.

The data item estimates the pure jet mixing noise component of gas turbine exhaust noise in the far field.

ESDU-74003 PC$74.50
Engineering Sciences Data Unit Ltd., London (England).
Normal Incidence Absorption Coefficients and Acoustic Impedances of Typical Single Layer Fibrous Lining Materials.
Data item.
Jun 73, 11p*
For information on availability of series, sub-series, and other individual data items, write NTIS, Attn: ESDU, Springfield, Va. 22161.

Descriptors: *Jet aircraft, *Gas turbines, *Combustion chamber linings, *Acoustic impedance, Ducts, Acoustic insulation, Honeycomb laminates, Attenuation, Metal fibers, Graphic methods, User needs, Great Britain.
Identifiers: ESDU/N, *Exhaust noise, *Design engineering, *Engineering design data.

The data item gives a method of estimating the normal incidence absorption coefficients and acoustic impedances of fibrous materials commonly used to line aircraft gas turbine propulsion ducts.

ESDU-74004 PC$74.50
Engineering Sciences Data Unit Ltd., London (England).
Normal Incidence Absorption Coefficients and Acoustic Impedances of Single Layer Perforated Sheet Liners.
Data item.
Jun 73, 13p*
For information on availability of series, sub-series, and other individual data items, write, NTIS, Attn: ESDU, Springfield, Va. 22161.

Descriptors: *Jet aircraft, *Gas turbines, *Combustion chamber linings, *Acoustic impedance, Ducts, Acoustic insulation, Cavities, Attenuation, Graphic methods, User needs, Great Britain, Honeycomb cores.
Identifiers: ESDU/N, *Exhaust noise, *Design engineering, *Engineering design data.

The data item gives a method for estimating the normal incidence absorption coefficients and acoustic impedances of single layer, cavity backed gas turbine duct liners.

N75-25968/9GA PC$5.75/MF$2.25
Bolt, Beranek, and Newman, Inc., Canoga Park, Calif.
Evaluation of the NASA Ames No. 1 7 by 10 Foot Wind Tunnel as an Acoustic Test Facility.
J. F. Wilby, and T. D. Scharton. 30 Jun 75, 135p
NASA-CR-137712, BBN-2936
Contract NAS2-8382

Descriptors: *Acoustic measurements, *Research facilities, *Wind tunnels, Calibrating, Noise generators, Noise threshold, Sound waves, Wave propagation.

For abstract, STAR 1317

N75-26346/7GA PC$3.75/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Porz (West Germany). Inst. fuer Angewandte Gasdynamik.
Aero-Acoustic Microphone Shrouds for Sound Measurement and Localization within Flow Fields.
G. Schulz. 1975, 44p DLR-FB-75-08
In German; English Summary.

Descriptors: *Acoustic measurements, *Flow distribution, *Microphones, *Shrouds, *Subsonic wind tunnels, Aerodynamic noise, Disks (Shapes), Position (Location).

For abstract, STAR 1317

N75-26800/3GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Sound Measurement During Complex Noises, Part 1.
H. Niese. Jun 75, 14p NASA-TT-F-16429
Contract NASW-2481
Tran-Transl. into English from Arch. Tech. Messen (West Germany), V. 55-58, No. 330, Jul. 1963 p 157-160.

Descriptors: *Acoustic measurements, *Noise (Sound), *Sound waves, *Sound-sound interactions, Frequency analyzers, Microphones, Noise measurement.

For abstract, STAR 1317

N75-26803/7GA PC$3.25/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Berlin (West Germany). Inst. fuer Turbulenzforschung.
The Change of Microphone Sensitivity under Mean Flow Conditions.
W. Neise. 31 Jan 75, 24p DLR-FB-75-23
Subm-Sponsored by Deut. Forschungsgemeinschaft.

Descriptors: *Acoustic measurements, *Air flow, *Microphones, *Sensitivity, Acoustic ducts, Nose cones, Pressure measurements, Slits, Sound pressure, Turbulent flow.

For abstract, STAR 1317

PB-243 447/0GA PC$8.50/MF$2.25
Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control.
First Report on Status and Progress of Noise Research and Control Programs in the Federal Government. Volume 1: Report on Status and Progress.
Final rept.
Jun 75, 254p EPA/550/9-75/023-Vol-1
See also Volume 2, PB-243 448.

Descriptors: *Noise(Sound), *Noise reduction, Aircraft noise, Engine noise, Motor noise, Gear noise, Environmental engineering, Standards, Regulations, Government policies.
Identifiers: *Noise abatement, *Machinery noise, *Federal agencies.

Issued in compliance with Section 4(c)(3) of the Noise Control Act of 1972 (PL 92-574), this report describes Federal noise control and research activities and establishes a baseline of agency program information that may be used in subsequent years to assess progress in the Federal Government's noise control efforts. Thirty-nine Federal agencies were requested to submit information on their noise related activities to EPA. Volume I of the report contains a summary and assessment of reported activities which are described both by agency and by the following functional areas: noise standards and regulations, noise abatement, hearing conservation, technical assistance, and research.

PB-243 448/8GA PC$13.25/MF$2.25
Environmental Protection Agency, Washington, D.C. Office of Noise Abatement and Control.
First Report on Status and Progress of Noise Research and Control Programs in the Federal Government. Volume 2: Research Panel Reports.
Final rept.
Jun 75, 585p EPA/550/9-75/023-Vol-2
See also Volume 1, PB-243 447.

Descriptors: *Noise(Sound), *Noise reduction, Aircraft noise, Engine noise, Jet engine noise, Environmental engineering, Standards, Regulations, Government policies.
Identifiers: *Noise abatement, *Machinery noise, *Federal agencies.

Issued in compliance with Section 4(c)(3) of the Noise Control Act of 1972 (PL 92-574), this report describes Federal noise control and research activities and establishes a baseline of agency program information that may be used in subsequent years to assess progress in the Federal Government's noise control efforts. Thirty-nine Federal agencies were requested to submit information on their noise related activities to EPA. Volume 2 consists of four reports describing Federal agency noise research, development, and demonstration programs in the areas of surface vehicle noise, aviation noise, noise effects, and machinery noise. The reports include project descriptions and fiscal data and were prepared jointly by the membership of four interagency research panels, formed in 1974 by EPA.

20B. Crystallography

AD-A013 587/1GA PC$3.25/MF$2.25
Fairleigh Dickinson Univ Teaneck N J
Imperfections in Metastable Crystals and their Relation to Stability.
Final rept. 17 Mar 67-16 Oct 74,
Oswald Haase. 20 Apr 75, 10p ARO-6731.3-C
Grants DA-ARO(D)-31-124-G903, DA-ARO(D)-31-124-G1006

Descriptors: *Azides, *Decomposition, *Crystal structure, X ray diffraction, Thermal expansion, Barium compounds, Potassium compounds, Sodium azides.
Identifiers: X ray topography, Barium azides, Potassium azides.

In order to localize the decomposition sites in solid Ba, K and Na Azides i.e. whether the decomposition occurs (1) homogeneously through the solid or (2) at dislocation sites inside the crystal or (3) on the surface, X-ray diffraction, X-ray topography, electron diffraction, optical microscopy and gas emission studies were made. The results indicate that the decomposition in its very first stage occurs at or near the surface at a few individual sites. It is not known whether these sites coincide with the emergence of dislocations from the interior. However, the density of sites is much smaller than the density estimated from X-ray topography measurements.

AD-A013 600/2GA PC$5.75/MF$2.25
Raytheon Co Waltham Mass Research Div
Magnetic Bubble Devices.
Final technical rept. 20 Jun 74-20 Jun 75,
Ernst Schloemann, and H. J. Van Hook. Jun 75, 128p Rept no. S-1889
Contract N00014-74-C-0369

Descriptors: *Magnetic domains, *Domain walls, *Magnetic materials, *Garnet, Microwave frequency, Polarization, Electromagnetic fields, Single crystals, Stability, Instability, Strain(Mechanics), Substrates, Ferrites, Gadolinium, Gallium, Differential equations, High velocity, Mass, Anisotropy.
Identifiers: Effective Mass, Critical Velocity, Magnetic Films, WKB Approximation, Circular Polarization, Bloch Lines, Twisted walls, Orthorhombic crystals, *Magnetic bubble domains.

The effect of an in-plane anisotropy on the static and dynamic wall structure has been calculated. The results show that the critical velocity, at which wall motion becomes unstable, will be much higher in films with a strong in-plane anisotropy than in films without this anisotropy. A new method of generating the desired in-plane anisotropy by means of strain is described. The maximum strain that can be achieved is limited primarily by cracking of the substrates, and is approximately 0.0005 for GGG. The theory of wall motion at relatively low speeds has been extended by solving the differential equation for the wall-structure by means of the WKB approximation. The results show that the wall mass is nonuniform, having peaks that are associated with the critical points of the static wall structure. A theory of domain wall motion induced by microwave magnetic fields has been developed. (Author)

AD-A013 745/5GA PC$3.25/MF$2.25
Northwestern Univ Evanston Ill Dept of Materials Science and Engineering
Relativistic Molecular Calculations in the Dirac-Slater Model,
A. Rosen, and D. E. Ellis. 8 Nov 74, 13p AFOSR-TR-75-1213
Grant AF-AFOSR-2012-71
Availability: Pub. in Jnl. of Chemical Physics, v62 n8 p3039-3049, 15 Apr 75.

Descriptors: *Crystal structure, *Nuclear shell models, *Wave functions, *Quantum theory, *Wave functions, Nuclear energy levels, Nuclear spins, Perturbation theory, Hamiltonian, Molecular rotation, Eigenvectors, Diatomic molecules, Indium compounds, Halides, Reprints.
Identifiers: *Binding energies, DIRAC-Slater model, DIRAC-Fock method, *Variational method.

AD-A013 747/1GA PC$3.25/MF$2.25
Northwestern Univ Evanston Ill Dept of Physics
Theoretical Determinations of Charge and Spin Densities,
A. J. Freeman, and D. E. Ellis. 1974, 19p AFOSR-TR-75-1119
Grant AF-AFOSR-2012-71
Availability: Pub. in Journal de Physique, 35 pC6-3-C6-20 1974.

Descriptors: *Crystal structure, *Nuclear spins, *Electron density, *Quantum theory, Mossbauer effect, Hamiltonian, Schrodinger equation, Atoms, Molecules, Nuclear moments, Solid state physics, Isomers, Phase shift, Reprints.
Identifiers: Dirac equation.

Recent developments in the theoretical determinations of charge and spin densities in atoms, molecules and crystalline solids are reviewed. Results for selected examples of recent work in each of these areas are presented in order to illustrate the present state of the theory for both the nonrelativistic and relativistic regimes. Comparisons with such experimental data as isomer shifts, quadrupole splittings and neutron magnetic form factors are given when appropriate in order to indicate the reliability of the results obtained. (Author)

AD-A013 779/4GA PC$4.75/MF$2.25
Little (Arthur D) Inc Cambridge Mass
Study, Design and Fabricate a Cold Crucible System.
Final rept. 1 Nov 73-28 Feb 75,
Joseph F. Wenckus, Martin L. Cohen, Alfred G. Emslie, Wilson P. Menashi, and Peter F. Strong. 31 Mar 75, 76p AFCRL-TR-75-0213
Contract F19628-74-C-0097
See also AD-786 481.

Descriptors: *Crystal growth, *Semiconductors, *Refractory materials, *Crucibles, Oxides, Zirconium oxides, Fabrication, Electrical properties, Thermal analysis.
Identifiers: Design.

The objective of this program was to conduct a study, design and fabricate a cold crucible system for the synthesis and crystal growth of refractory semiconductors and oxides. A theoretical analysis of the cold crucible relating the properties of the material to the electrical characteristics of the cold crucible was completed. The thermal analysis, which includes thermal modeling by means of a computer technique, was also completed. A detailed analysis of the RF power control system necessary to provide the desired stability for crystal growth was also carried out. Using a 50 Kw (4-7 megahertz) RF power supply the cold crucible assembly was tested and kilogram melts of zirconia (melting point 2690C) were successfully contained.

AD-A013 878/4GA PC$3.75/MF$2.25
Isomet Corp Springfield Va
Growth of Doped and Undoped Single Crystal Laser Materials in the System (MF2)x.(YF3)(1-x).
Final rept. Mar 73-Apr 74,
Joseph F. Balascio. 23 May 75, 35p Rept no. TR-225 AFML-TR-75-66
Contract F33615-73-C-5058

Descriptors: *Laser materials, *Fluorides, *Crystal growth, Alkaline earth compounds, Crystal structure, Calcium fluorides, Yttrium compounds, Phase studies, Doping, Rare earth elements, Terbium compounds, Neodymium compounds, Single crystals.
Identifiers: Czochralski method, Bridgman growth technique, Yttrium fluorides, Neodymium fluorides, Terbium fluorides.

Laser host materials were grown in the CaF2-YF3 and BaF2-YF3 binaries. Two compositions in the former binary were found to be capable of producing single crystals: 9CaF2.YF3 and CaF2.2.6YF3. The former possessed a fluorite structure and the latter was indexed on a hexagonal unit cell. Trivalent and divalent rare earth-doped single crystals of these compositions were successfully grown. The necessary phase equilibria is presented and discussed.

AD-A013 893/3GA PC$3.25/MF$2.25
Georgia Inst of Tech Atlanta School of Chemical Engineering
Deformation Twinning of Cu3Au,
S. B. Chakrabortty, and E. A. Strake, Jr. 5 Jun 74, 11p AFOSR-TR-75-1155
Grant AF-AFOSR-2064-71
Availability: Pub. in Acta Metallurgica, v23 p63-71 Jan 75.

Descriptors: *Copper alloys, *Gold alloys, *Deformation, *Twinning(Crystallography), Single crystals, Reprints.

PATENT-3 888 705 Not available NTIS
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Vapor Phase Growth of Groups 3-5 Compounds by Hydrogen Chloride Transport of the Elements.
Patent.
R. C. Tyagi, W. J. Debnam, Jr., M. F. Mcnear, R. K. Crouch, and R. A. Breckenridge. Patented 10 Jun 75, 6p PAT-APPL-426 405
Misc-Filed 19 Dec. 1973 Supersedes N74-27261 (12-16, p 1958).
Government-owned invention available for licensing. Copy of patent available from Commissioner of Patents, Washington, D.C. 20231 $.50.

Descriptors: *Chemical reactions, *Crystal growth, *Gallium arsenides, *Single crystals, Equipment specifications, *Patents, Product development, Test equipment.
Identifiers: PAT-CL-148-175.

A method of forming binary, ternary, and quaternary compounds derived from elements of groups III and V by a hydrogen chloride-hydrogen carrier gas is reported. The gas is separately contacted with the desired elements at elevated temperatures to provide the corresponding subchlorides, which are then transported to a reaction zone for final deposition of the respective elements on a single crystal substrate derived from one or more elements of groups III or V. The rate of flow of the carrier gas over each element is adjusted such that the elements are deposited on the substrate in sufficient amounts to provide the desired binary, ternary, or quaternary compound.

RISO-M-1791 PC$4.00/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
Growing Single Crystals of Lithium.
M. M. Beg. Apr 75, 12p
U.S. Sales Only.

Descriptors: (*Lithium 7, *Crystal growth), Bridgman method, Lattice vibrations, Monocrystals, Uses.

For abstract, see NSA 32 03, number 08422.

20C. Electricity and Magnetism

AD-A013 606/9GA PC$4.25/MF$2.25
Stevens Inst of Tech Hoboken N J Cryogenics Center
Thermoelectricity and Refrigeration at Low Temperatures.
Final rept. Sep 74-Jun 75,
John G. Daunt. Jun 75, 60p
Contract N00014-67-A-0202-0027

Descriptors: *Thermoelectricity, *Cryogenics, *Refrigeration systems, Low temperature, Cryostats, Layers, Gases, Single crystals, Gallium, Desorption, Impurities, Isotherms.

The research programs were: (A) Thermoelectricity at very low temperatures; (B) Physics of adsorbed gas layers and desorption refrigeration; (C) Experimental studies of cryogenic refrigeration.

AD-A013 758/8GA PC$3.25/MF$2.25
Stanford Univ Calif Microwave Lab
Insertion Compounds of 2H-TaS2.NH3,
S. F. Meyer, J. V. Acrivos, and T. H. Geballe. 14 Nov 74, 6p Rept no. ML-2390 AFOSR-TR-75-1146
Grant AF-AFOSR-2435-73
Availability: Pub. in Proceedings of the National Academy of Sciences of the United States of America, v72 n2 p464-468 Feb 75.

Descriptors: *Superconductors, Chalcogens, Layers, Transition temperature, Tantalum compounds, Sulfides, Hydrides, Stoichiometry, Ammonium compounds, Solutions(Mixtures), Reprints.

A new method of intercalating metals into layer compounds has been developed using electrolytic generation from the salt solution in ammonia. The results suggest that metals that are soluble in ammonia will form a homogeneous metal-ammonia intercalate layer, NH3.MX, when x is less than the limiting solubility of M in NH3. The superconducting transition temperature (Tc) was found to increase as the c-axis expansion. Of all the alkali metals, potassium gave the most stable compounds and the highest Tc, 4.7K.

AD-A013 955/0GA PC$3.25/MF$2.25
Science Applications Inc Mclean Va
X-Ray Produced Charge Deposition and Dose in Dielectrics near Interfaces Including Space-Charge Field and Conductivity Effects,
W. L. Chadsey. 1974, 10p AFCRL-TR-75-0209
Contract F19628-73-C-0276
Availability: Pub. in IEEE Transactions on Nuclear Science, vNS-21 p235-242 Dec 74.

Descriptors: *Dielectrics, *Space charge, *X rays, *Gamma rays, Radiation effects, Dosage, Conductivity, Electric fields, Gold, Polyethylene, Interfaces, Reprints.
Identifiers: Photo-compton current, Charge buildup.

When a dielectric material is exposed to x-rays or gamma-radiation, charge buildup occurs in regions of the dielectric near interfaces with dissimilar media. The charge buildup results from the divergence of photo-Compton current near the interface. The charge density acts as a source for an electric field. If one assumes a transient dielectric conductivity equal to the bulk radiation-induced conductivity of the dielectric, one can predict a sufficiently large x-ray generated space-charge field at high exposures to either limit the photo-Compton current - hence perturb the depth-dose profile in the dielectric - or initiate dielectric breakdown. There also occurs at the interface, however, a gradient in dose which should produce a gradient in transient conductivity. This conductivity gradient, it is shown, profoundly modifies the charge buildup and space-charge field in the dielectric. Calculations of current density, charge density, and space-charge field are presented for a planar gold/polyethylene interface irradiated by 30, 100, 200, and 1000 keV x-rays. It is found that for the lower x-ray energies the saturation space-charge field is too low to significantly perturb the depth-dose profile or initiate breakdown, but for the 1000 keV x-rays the saturation space-charge field may be sufficiently high to significantly perturb the depth-dose profile. In all cases, the charge density profile is strongly perturbed by the conduction currents, even for relatively low exposures.

AD-A013 960/0GA PC$3.25/MF$2.25
California Univ San Diego La Jolla Dept of Physics
Pressure Dependence of the Superconducting Transition Temperature for Ternary Molybdenum Sulfides.
RR. N. Shelton, A. C. Lawson, and D. C. Johnston. 24 Feb 75, 8p AFOSR-TR-75-1113
Contract F44620-72-C-0017
Availability: Pub. in Materials Research Bulletin, v10 p297-302 1975.

Descriptors: *Superconductors, Ternary compounds, Molybdenum compounds, Sulfides, Pressure, Transition temperature, Reprints.
Identifiers: *Ternary Molbdenum Sulfides.

The variation of the superconducting transition temperature for some ternary molybdenum sulfides (Chevrel Phase) has been investigated as a function of hydrostatic pressure up to 22 kbar. The effects of pressure on TC are the largest yet report for any set of compounds. (Author)

AD-A013 961/8GA PC$3.25/MF$2.25
California Univ San Diego La Jolla Dept of Physics
Superconductivity in 1973,
Bernd T. Matthias. 1974, 3p AFOSR-TR-75-1210
Contract F44620-72-C-0017
Availability: Pub. in International Jnl. of Quantum Chemistry, Symposium (8th), p499-500 1974.

Descriptors: *Superconductors, *State of the art, Organic materials, Crystals, Solid state physics, Niobium alloys, Germanium alloys, Lithium compounds, Titanium oxides, Reprints.

Superconductivity in 1973 experienced steeper ups and downs than at any other time during the past five years. (Author)

AD-A013 963/4GA PC$3.25/MF$2.25
California Univ San Diego La Jolla Dept of Physics
Superconductivity and Stability of Near Equiatomic V-Ru Compounds at High Pressure,
T. F. Smith, R. N. Shelton, A. C. Lawson, and C. W. Chu. 28 Jan 74, 12p AFOSR-TR-75-1194
Contract F44620-72-C-0017, Grant NSF-GH-40866
Availability: Pub. in Jnl. of Physics, F: Metal Physics, v4 p1423-1432 Sep 74.

Descriptors: *Superconductors, Temperature, Equations of state, Vanadium compounds, Rubidium compounds, Crystals, Distortion, Pressure measurement, Reprints.

20D. Fluid Mechanics

AD-A013 598/8GA PC$3.75/MF$2.25
Naval Ship Research and Development Center Bethesda Md Aviation and Surface Effects Dept
Aerodynamic Characteristics of a 10 deg Sharp Cone at Hypersonic Speeds and High Angles of Attack.
Final rept.,
George S. Pick, Samuel E. Dawson, and Robert L. Walker. Jun 75, 28p Rept no. Aero-1211 NSRDC-4692
Presented at the Navy Symposium on Aeroballistics (9th), Applied Physics Laboratory, the Johns Hopkins University, 9-11 May 1972.

Descriptors: *Hypersonic flow, *Conical bodies, *Hypersonic characteristics, *Free flight models, *Aeroballistics, Angle of attack, Lift, Aerodynamic drag, Wind tunnel tests, Base pressure, Base flow, Pressure distribution, Sharp bodies, Reynolds number, Free flight trajectories.

A free-flying instrumented model was tested in a hypersonic facility at M = 5.30, 6.34 and 9.94 and Re = 300,000 to 1,200,000 ft. Aerodynamic lift, total drag and base drag coefficients were obtained together with detailed base pressure distribution measurements at angles of attack from 0 to 60 deg. The measured lift and drag coefficients showed good agreement with the modified Newtonian theory. The centerline base pressure/free-stream static pressure, psia distribution was nearly independent of the angle of attack from -10 to -30 deg but increased rapidly for all test conditions beyond alpha = -30 deg. For similar conditions at angle of attack and Reynolds number, an increase in Mach number resulted in an increase of the base pressure ratio. The measurements indicated a highly complex base flow region, and tentative explanation of the observed results was offered.

AD-A013 686/1GA PC$3.25/MF$2.25
Naval Ordnance Lab White Oak Md
Hypersonic Two-Phase Flow with Massive Blowing.
Final rept. 19 Mar 74-19 Mar 75,
Kuei-Yuan Chien. Jun 75, 25p ARL-75-0131
See also report dated Mar 74, AD-778 080.

Descriptors: *Hypersonic flow, *Two phase flow, Hypervelocity, Flat plate models, Nozzles, Equations of motion, Particles, Drag, Heat transfer.
Identifiers: Blowing.

The problem of a hypersonic two-phase flow over a porous flat plate (or banks of nozzles) with massive blowing was considered. The method of integral relations was applied to simplify the governing equations and the starting solution was discussed. A detailed review of the particle drag and heat-transfer laws was included. Some suggestions for further work were also discussed.

AD-A013 813/1GA PC$8.50/MF$2.25
Virginia Polytechnic Inst and State Univ Blacksburg
Effects of Mass Transfer Into Laminar and Turbulent Boundary Layers Over Cones at Angle of Attack.
Final rept. 7 Dec 72-1 Apr 75,
Michael C. Frieders, and Clark H. Lewis. Aug 75, 255p AEDC-TR-75-55
Contract F40600-73-C-0005

Descriptors: *Boundary layer flow, *Atmosphere entry, *Conical bodies, *Supersonic characteristics, Hypersonic characteristics, Sharp bodies, Blunt bodies, Angle of attack, Laminar boundary layer, Mass transfer, Turbulent boundary layer, Boundary layer transition, Computer programs, Three dimensional flow, Equations of motion, Mathematical models, Simulation.

A computer program has been developed for full three-dimensional boundary-layer analysis of sharp and blunt cones at angle of attack to supersonic and hypersonic flows. This analysis includes laminar, transitional, and turbulent flows, with mass transfer of various foreign gases at the wall. The governing boundary-

layer equations are integrated on a digital computer using a marching implicit finite-difference scheme. Turbulence has been modeled by a two-layer eddy viscosity-mixing length approach employing an intermittency factor in the transition region. Results of the program calculations are compared to available experimental and numerical data.

AD-A013 835/4GA PC$7.00/MF$2.25
Von Karman Inst for Fluid Dynamics Rhode-Saint-Genese (Belgium)
Velocity Profile Measurements in the Knudsen Layer for the Kramers Problem.
Interim scientific rept.,
M. A. Reynolds, J. J. Smolderen, and J. F. Wendt. Jun 74, 184p Rept no. VKI-TR-99
AFOSR-TR-75-0935
Grant AF-AFOSR-2408-72

Descriptors: *Rarefied gas dynamics, *Boundary layer flow, Experimental data, Mathematical models, Molecules, Approximation(Mathematics), Flow fields, Flat plate models, Model tests, Probes, Surface properties, Velocity, Measurement.
Identifiers: Knudsen layer, Velocity profiles, Free molecule flow.

An experimental study of the Knudsen layer is reported. The use of an effusive source to generated a local approximation to the Kramers problem over a flat surface is described. Velocity profiles are measured with a free molecule orifice technique which required no assumptions as to the form of the molecular velocity distribution function. Data are obtained in the Knudsen layer for polished aluminum, oil and Crocus cloth surfaces. The normalized slip coefficients for these surfaces are in agreement with theoretical predictions for the BGK and pseudo-Maxwellian molecular models, found by different techniques, if the tangential momentum accommodation coefficients are 0.96, 0.90 and 1.07 for the respective surfaces. Within the Knudsen layer, the velocity profile is compared with the linearized BGK model equation.

AD-A013 858/6GA PC$3.75/MF$2.25
Yale Univ New Haven Conn Dept of Engineering and Applied Science
Pressure Recovery in Constant Area Supersonic Diffusers,
Peter E. Merkli. Sep 74, 40p Rept no. Scientific-2 AFOSR-TR-75-1067
Contract F44620-73-C-0032
Report on Supersonic Diffuser Research.

Descriptors: *Supersonic diffusers, *Performance(Engineering), *Pressure signatures, Wind tunnels, Ducts, Test methods, Boundary layer flow, Static pressure, Pressure distribution, Nozzle gas flow, Laval nozzles, Viscous flow.
Identifiers: Pressure recovery.

Knowledge of diffuser performance is largely based on specific configurations of a given facility, often leading to little generality. With new interest in diffuser performance, this report aims at giving a more general view of the view of the behavior of the simplest supersonic diffuser, the constant area duct. Experiments were performed in a wide range of Reynolds number, Mach number and a boundary layer parameter. No clear dependence of the pressure recovery on the Reynolds number was found in the range investigated, but charts based on the experiments and supported by a simplified model correlate the pressure recovery and the length of the recovery zone as functions of Mach number and boundary layer parameter.

AD-A013 882/6GA PC$5.25/MF$2.25
Advisory Group for Aerospace Research and Development Paris (France)
Two-Dimensional Shock Wave-Boundary Layer Interactions in High Speed Flows,
W. L. Hankey, Jr., and M. S. Holden. Jun 75, 117p Rept no. AGARD-ograph-203
NATO furnished.

Descriptors: *Boundary layer flow, *Shock waves, *Supersonic characteristics, Interactions, Laminar flow, Turbulent flow, Integral equations, Numerical methods and procedures, Computations, Experimental data, Flow separation, Hypersonic characteristics, Attachment, Two dimensional flow, Finite difference theory, NATO.

A review is made of two-dimensional supersonic interactions including separation for laminar and turbulent flows. Part 1 discusses recent theoretical developments in interacting flows and presents numerical techniques for calculating these flows, including finite difference and integral methods. Theoretical discussions are presented for both laminar and turbulent interactions. Part 2 reviews recent experimental studies which have been directed towards understanding the fluid mechanics of attached and separated regions of shock wave-boundary layer interaction in the supersonic annd hypersonic flow.

AD-A013 897/4GA PC$3.25/MF$2.25
Missouri Univ Columbia Chemical Labs
Observations and Measurement of the Mercury Pumping Effect on Several Gases by Four New Methods,
Lloyd B. Thomas, Robert E. Harris, and C. Leon Krueger. 1974, 6p AFOSR-TR-75-1106
Grant AF-AFOSR-2440-73
Presented at Proceedings of the International Vacuum Congress (6th), Kyoto (Japan), 25-29 Mar 74.
Availability: Pub. in Japanese Jnl. of Applied Physics, suppl 2 pt 1 p151-154 1974.

Descriptors: *Rarefied gas dynamics, High pressure, Pumping, Measurement, Errors, Mercury, Vacuum pumps, Momentum transfer, Thermal analysis, Aerodynamic drag, Symposia, Reprints.

An account is given of several experimental situations that have arisen in our research on thermal accommodation and tangential momentum accommodation in which we have been forced to recognize the mercury pumping effect to make sense of our observations. For these, semiquantitative estimates of the magnitude of the pressure increment are extracted from the data. Two methods, introduced by us, for making reliable quantitative measurement of the pressure increments are described and results by one of these are given in some detail. Data on the second method, which senses the pressure increment by a Pirani gauge, should be ready in March, 1974, for the Congress. (Author)

AD-A013 907/1GA PC$3.25/MF$2.25
Missouri Univ Columbia Dept of Chemistry
Comparative Measurements of Tangential Momentum and Thermal Accommodations on Polished and on Roughened Steel Spheres,
Lloyd B. Thomas, and R. G. Lord. 1975, 10p
AFOSR-TR-75-1105
Grant AF-AFOSR-0094-67
Availability: Pub. in Rarefied Gas Dynamics, p405-412 1974.

Descriptors: *Spheres, *Rarefied gas dynamics, Steel, Tangents, Momentum transfer, Thermal analysis, Isotropism, Aerodynamic drag, Torque, Reprints.

The research reported here was conceived as an initial attempt to bring experimental knowledge of tangential momentum accommodation of isotropic gases on controlled surfaces to a stage of development comparable with that found in the thermal accommodation field. Measurement of the drag torque experienced by spinning objects held in practically frictionless magnetic suspension when immersed in low pressure gases has been used to measure the tangential momentum accommodation coefficient, sigma. All precise determinations of the thermal accommodation coefficient, alpha, have been made on fine filament systems so it was necessary to devise new means to determine alpha on the same surfaces of the relatively massive objects as are used for sigma determination. The method described in this paper is original, so far as we know, when applied to measurement of alpha on metal surfaces at low gas pressure. (Author)

AD-A013 911/3GA PC$4.75/MF$2.25
Maryland Univ College Park Dept of Aerospace Engineering
Numerical Solutions of the Navier-Stokes Equations for Laminar and Turbulent Supersonic Mixing Flows.
Final rept.,
Everett Jones, and John D. Anderson, Jr. Jun 75, 131p Rept no. AE-75-5 AFOSR-TR-75-1187
Grant AF-AFOSR-2575-74

Descriptors: *Turbulent flow, *Laminar flow, *Navier Stokes equations, Supersonic flow, Nozzle gas flow, Chemical lasers, Gas dynamic lasers, Boundary value problems, Partial differential equations, Numerical integration, Computer programming, Computations.

A modification of MacCormack's two step computational method is applied to flow of a perfect gas with constant thermal properties between parallel, free boundaries. The complete Navier-Stokes equations were applied. Such flow predictions are fundamental to later extension of computer programs to include the kinetics and diffusion for flow downstream of the nozzle stacks with a chemical laser or a downstream mixing gasdynamic laser. A laminar flow program was constructed first and checked out by application to flow problems with exact solutions. The checkout of the laminar flow program indicated that satisfactory results could be obtained at reasonable expense. This program was extended to produce two turbulent flow programs. One program utilizes a mixing length model while the other applies the Saffman-Wilcox-Alber turbulence model. Application of the turbulent programs to nozzle exit flows with smooth profiles at the exit plane of the nozzles produced satisfactory results. However, if these profiles have the discontinuous profiles characteristic of the ideal mixing of two parallel streams, a relatively small amplitude, steady state oscillation develops. Further investigations are in process to remove this oscillation and to extend these programs to treat downstream mixing gasdynamic lasers.

AD-A013 952/7GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Intrepretation of Merged Layer Behavior for Wedges.
Journal article,
Judson R. Baron. 15 Jul 74, 4p Rept no. JA-4405 ESD-TR-75-196
Contract F19628-73-C-0002
Availability: Pub. in AIAA Jnl., v13 n3 p410-412 Mar 75.

Descriptors: *Boundary layer flow, Wedges, Leading edges, Supersonic flow, Hypersonic flow, Convection(Heat transfer), Laminar boundary layer, Laminar flow, Interfaces, Inviscid flow, Coupling(Interaction), Reprints.

Proceeding downstream from a leading edge there are idealized regimes referred to as kinetic, merged, strong and weak interaction, some of which may be of appreciable extent in a hypersonic flow. The over-all extremes are the

well known free molecule flow at the leading edge and the boundary layer with an adjacent inviscid shock layer sufficiently far downstream. The merged layer portion has received particular attention for sharp flat plates in hypersonic flow and Shorenstein has provided an extension to wedges and cones which shows rather good agreement with experimental data. He used a local similarity analysis to match both flow variables and their normal gradients at the 'interface' between the adjacent shock and boundary-layer structures. The approach is essentially an extension of an earlier flat plate study which correctly indicated departures from strong interaction behavior near a leading edge. Implicit in Shorenstein's wedge analysis is a generalization of the plate behavior such that a strong interaction always follows the merged region. The generalization proves to be somewhat misleading and the present purpose is a clarification of that point for the specific parameter ranges that were considered as well as qualitatively in general. In view of some important numerical inaccuracies, a secondary purpose relates to the need for caution when applying the summary correlations. (Author)

AD-A014 005/3GA PC$3.75/MF$2.25
National Aeronautical Establishment Ottawa (Ontario)
A Numerical Determination of the Bow Shock Wave in Transonic Axisymmetric Flow about Blunt Bodies.
Aeronautical rept.,
D. J. Jones, and J. C. South, Jr. May 75, 49p
Rept no. NAE-LR-586 NRC-14765
Also pub. as ISSN-0077-5541.

Descriptors: *Blunt bodies, *Transonic characteristics, *Shock waves, Axially symmetric flow, Numerical methods and procedures, Computations, Equations of motion, Computer applications, Iterations, Spheres, Flow fields, Canada.
Identifiers: Bow shock waves.

A numerical method is developed for calculating axisymmetric transonic flow about a blunt body. The bow shock wave location is of particular interest. A Rankine Hugoniot jump is applied at the shock while relaxation on the isentropic equation of motion is used between shock and body. The shock wave is adjusted by a Newton type iteration scheme. Results are given for a sphere in the Mach number range 1.62 down to 1.02.

AD-A014 034/3GA PC$3.25/MF$2.25
Catholic Univ of America Washington D C Hydrodynamics Lab
Theory of Wake Collapse in a Stratified Fluid.
Technical rept. 1 May 74-20 Jun 75,
Timothy W. Kao. 20 Jun 75, 19p Rept no. HY-75-002
Contracts N00014-67-A-0377-0027, N00014-75-C-0910

Descriptors: *Wake, *Fluid dynamics, *Underwater vehicles, Hydrodynamics, Stratification, Collapse, Theory, Two dimensional flow, Numerical methods and procedures, Mathematical models, Self propelled.
Identifiers: Wake collapse, Stratified fluids.

A complete theory of the collapse of a wake in the form of a two-dimensional circular mixed region of uniform density in a linearly stratified fluid is given. The initial stage is based on existing theories and the principal stage is based on the concept of a quasi-steady density current in a stratified environment. The two stages are properly matched. The dimensionless time at the initiation of the principal stage is theoretically determined. The theoretical finding is in excellent agreement with previous numerical and experimental results.

AD-A014 061/6GA PC$3.25/MF$2.25
Catholic Univ of America Washington D C Hydrodynamics Lab
On Vortex Structure in the Wake of a Sphere.
Technical rept. 1 May 74-30 Apr 75,
Hsien-Ping Pao, and Timothy W. Kao. 1 May 75, 25p Rept no. HY-75-001
Contract N00014-67-A-0377-0027

Descriptors: *Wake, *Spheres, *Vortex shedding, Helixes, Three dimensional flow, Stratification, Turbulence, Mathematical models.
Identifiers: Wake collapse.

This paper presents results showing the three-dimensional vortex shedding structure when a sphere is towed at a constant velocity through a stratified fluid. It is found that for certain Richardon and Reynolds numbers the vortex is shed three-dimensionally. The stratification however quickly inhibits the vertical motion and the initially turbulent wake collapses and reveals the vertically oriented portion of the vortex structure, reminiscent of two-dimensional vortex street behind a circular cylinder when viewed from above. Two branches of a double helix are continuously unwinding in an opposite sense from the formation region. The double helical model satisfies Thompson's circulation theorem.

AD-A014 088/9GA PC$4.75/MF$2.25
Rochester Applied Science Associates N Y
High Lift Generation by the Use of Vortices.
Final technical rept. Jan-Dec 74,
Richard P. White, Jr, and Andrew D. Zalay. Jul 75, 96p Rept no. RASA/SRL-74-12
Contract N00014-74-C-0091

Descriptors: *Lifting surfaces, *Aerodynamic characteristics, *Vortices, Wings, Interactions, High lift, Mathematical models, Theory, Experimental data, Control systems, Canard configuration, Drag, Pressure distribution.
Identifiers: Wing vortex interactions, Lift augmentation.

A theoretical research program was conducted to investigate the feasibility of improving the aerodynamic lift and drag characteristics of a highly loaded lifting surface by creating a favorable wing vortex interaction with concentrated line vortices located adjacent to the wing. Beneficial wing vortex interactions are found to be responsible for improved aerodynamic performance of high lift devices such as strakes, canards, and leading edge snags. A simplified analytic model has been developed.

COM-75-50428/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
Decay of Swirling Turbulent Flow of Incompressible Fluids in Long Pipes.
Final rept.,
D. W. Baker, and C. L. Sayre, Jr. 1974, 12p
Presented at Proceedings of Symposium on Flow (1st), Pittsburgh, Pa., 10-14 May 71.
Pub. in unidentified mono., Pittsburgh, 1974 p301-312.

Descriptors: *Pipes(Tubes), *Pipe flow, *Swirling.
Identifiers: Reprints.

The decay of swirling flow fields in steady state flow in cylindrical, unobstructed, smooth pipes is considered from measurements made in two pipes. Flowing water in one pipe, mean point velocities, static pressures and wall pressures were measured at several stations along the pipe. Flowing liquid hydrocarbons in the other pipe, measurements were made of wall pressure and the swirling motion of the fluid, as sensed by a vaned rotor. The investigation included the pipe Reynolds number (re) range 12,500 to 200,000 and for the vortex flows generated, the product K/MD varied from 0 to 0.9, where K is the angular momentum flux, M is the axial momentum flux, and D is the pipe ID.

N75-26306/1GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Pressure Distribution in a Converging-Diverging Nozzle During Two-Phase Choked Flow of Subcooled Nitrogen.
R. J. Simoneau. 1975, 12p NASA-TM-X-71782, E-8415
Conf-to Be Presented at the Winter Ann. Meeting of the AM. Soc. Of Mech. Engr., Houston, 30 Nov. - 5 Dec. 1975.

Descriptors: *Convergent-divergent nozzles, *Nitrogen, *Pressure distribution, *Two phase flow, Chokes (Restrictions), Critical pressure, Critical temperature, Flow velocity, Nozzle geometry, Stagnation pressure.

For abstract, STAR 1317

N75-26307/9GA PC$7.50/MF$2.25
Avco Corp., Wilmington, Mass.
The Nata Code: Theory and Analysis, Volume 1.
Final Report.
W. L. Bade, and J. M. Yos. Jun 75, 230p NASA-CR-2547, AVSD-0288-74-RR
Contract NAS9-9744

Descriptors: *Gas dynamics, *Nonequilibrium conditions, *Nozzle flow, *User manuals (Computer programs), *Wind tunnels, Laminar boundary layer, Mathematical models, Nozzle geometry, Stagnation point, Wedge flow.

For abstract, STAR 1317

N75-26308/7GA PC$3.75/MF$2.25
National Aeronautical Establishment, Ottawa (Ontario).
The Spreading of a Liquid Drop on a Plane Solid.
A. M. Drummond. Jan 75, 27p LR-583, NRC-14579

Descriptors: *Drop size, *Drops (Liquids), *Spreading, Liquid atomization, Spray characteristics, Spray nozzles, Stroboscopes, Teflon (Trademark).

For abstract, STAR 1317

N75-26312/9GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
The Effect of Initial Flow Nonuniformity on Second-Stage Fuel Injection and Combustion in a Supersonic Duct.
W. R. Russin. Jun 75, 52p NASA-TM-X-72667

Descriptors: *Fuel injection, *Inlet flow, *Supersonic combustion ramjet engines, *Supersonic inlets, Heat transfer, Hydrogen fuels, Mixing, Stoichiometry.

For abstract, STAR 1317

N75-26314/5GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

Maximum Two-Phase Flow Rates of Subcooled Nitrogen Through a Sharp-Edged Orifice.
R. J. Simoneau. 1975, 22p NASA-TM-X-71760
Conf-Presented at Cryog. Eng. Conf., Kingston, Ontario, 22-25 Jul. 1975.

Descriptors: *Liquid nitrogen, *Orifice flow, *Two phase flow, Isotherms, Jet flow, Stagnation pressure, Thermodynamics.

For abstract, STAR 1317

N75-26316/0GA PC$3.25/MF$2.25
National Center for Atmospheric Research, Boulder, Colo.
The Vortex Street as a Statistical-Mechanical Phenomenon.
D. Montgomery. Jun 74, 10p NASA-CR-143060
Contract NGL-16-001-043
Subm-Submitted for Publication Sponsored in Part by NSF.

Descriptors: *Inviscid flow, *Karman vortex street, *Navier-stokes equation, *Statistical mechanics, Flow distribution, Incompressible fluids, Numerical analysis, Shear flow, Two dimensional flow.

For abstract, STAR 1317

N75-26319/4GA PC$4.25/MF$2.25
Oxford Univ. (England). Dept. of Engineering Science.
Thermodynamic Aspects of Cavitation in Pumps. Part 2: The Oxford University Multi-Fluid High Temperature Cavitation Tunnel. Design and Constructional Features.
M. E. P. Wykes. 1974, 72p OUEL-1109/74
Contract AT/1057/107/NEL

Descriptors: *Cavitation flow, *High temperature, *Hydraulic test tunnels, *Pumps, *Thermodynamic properties, Equipment specifications, Hydrodynamics, Liquids, Tube heat exchangers.

For abstract, STAR 1317

N75-26320/2GA PC$3.75/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Two-Dimensional Flow Field of an Axisymmetric Laval Nozzle. Part 2: Computer Program and Operation Instructions Zweidimensionales Stroemungsfeld Einer Achsialsymmetrischen Lavalduese. Teil 2: Rechenprogramm und Bedienungsanleitung.
R. H. Schmucker. 1 May 74, 33p TUM-LRT-TB-20
Language in German.

Descriptors: *Computer programs, *Flow distribution, *Rocket nozzles, *Two dimensional flow, *User manuals (Computer programs), Algol, Axisymmetric flow, Method of characteristics.

For abstract, STAR 1317

WANL-TMI-1722 PC$5.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
General Loss Coefficient Program.
W. L. Jacob. 22 May 67, 45p

Descriptors: (*Gas flow, *Pressure drop), (*Computer codes, *L codes), Air, Argon, Computer calculations, Flow rate, Helium, Hydrogen, Reynolds number, Thermodynamic properties.

For abstract, see NSA 32 03, number 06339.

20E. Masers and Lasers

AD-A013 613/5GA PC$4.25/MF$2.25
Systems Science and Software La Jolla Calif
Sensitivity Analysis of a Chemical Laser System.
Final rept. 21 Mar-30 Jun 75,
H. B. Levine. Aug 75, 68p Rept no. SSS-R-75-2684
Contracts N00014-75-C-0981, ARPA Order-1806

Descriptors: *Chemical lasers, *Reaction kinetics, *Infrared lasers, Gas lasers, Hydrogen fluoride, Parametric analysis, Fourier analysis, Mathematical models, Diatomic molecules, Molecular energy levels, Response, Starting, Computerized simulation, Diffusion theory, Efficiency, Quantum theory, Diluents.
Identifiers: *Hydrogen Fluoride Lasers, Sensitivity Analysis Method, Vibrational States, Population Inversion, SAM(Sensitivity Analysis Method).

A new technique of sensitivity analysis has been applied to the Kerber-Emanuel-Whittier model of a pulse mode hydrogen fluoride chemical laser, so as to determine which parameter uncertainties most critically influence the model's ability to predict laser performance. The particular parameters directly considered were thirteen rate constants out of a set of 68 rate constants in the model, and also the initial concentration of fluorine atoms that start the chain processes which lead to population inversion. In an indirect sense, all 68 rate constants have been studied, because of empirical relations between various sets of constants controlling the formation rates of the excited vibrational states of the hydrogen fluoride molecule. The study covers the time period from 0.1 to 4.0 microseconds following initiation, and presently considers only zero power operation. Future work will treat the finite power case. The study demonstrates how the parameter uncertainties influence the predictions of the model. It shows that only a small subset, four in number, of all the parameters, have uncertainties which cause significant variance in the predictions. That is to say, the performance of the system, in the time range studied, is almost totally independent of the uncertainties in most of the rate constants.

N75-26361/6GA PC$6.25/MF$2.25
Hughes Aircraft Co., Malibu, Calif.
Opto-Mechanical Subsystem of a 10 Micrometer Wavelength Receiver Terminal. Waveguide Laser Local Oscillator. Servo System.
Final Report.
Mar 75, 164p NASA-CR-143745, SCG-50096R
Contract NAS5-21859

Descriptors: *Laser modes, *Microwave oscillators, *Optical heterodyning, *Waveguides, *Wavelengths, Dynamic loads, Performance tests, Receivers, Servomechanisms, Static loads, Temperature effects.

For abstract, STAR 1317

N75-26368/1GA PC$5.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Laser Induced Thermal Desorption on Solid Surfaces.
Ph.D. Thesis.
M. Neumann. Jun 75, 105p NASA-TT-F-16434
Contract NASW-2483

Tran-Transl. Into English of the Thesis "Laserinduzierte Thermische Desorption von Festkoerper - Oberflaechen" Hannover, Technische Universitat, 1973 122 p.

Descriptors: *Desorption, *Lasers, *Solid surfaces, *Thermal conductivity, Catalysts, Metal films, Molecular beams, Pulsed radiation, Raman spectroscopy, Reaction kinetics, Surface finishing, Thin films.

For abstract, STAR 1317

PATENT-3 734 592 Not available NTIS
Department of the Army Washington D C
High Intensity Light Limiting Device.
Patent,
Zoltan G. Sztankay, Richard J. Holland, and John P. Swirczynski. Filed 21 Jun 71, patented 22 May 73, 8p Rept nos. PAT-APPL-154 798,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Laser safety, *Safety devices, *Patents, Coherent radiation, Laser beams, Optical equipment, Mirrors, Coatings, Reflectivity, Lenses.
Identifiers: PAT-CL-350-17, *Laser radiation protection.

The patent discloses an optical device for limiting the transmission of high intensity light radiation through an optical system. The device includes a limiting mirror consisting of a thin evaporative partially absorbing, partially reflective coating deposited on a radiation absorbing substrate. An objective lens is provided to focus incident light on a portion of the limiting mirror to maximize the energy density of the incident light beam. If the energy density of the focused beam exceeds a predetermined level, a small portion of the reflective coating is vaporized, markedly reducing the reflectivity of that portion of the limiting mirror. A portion of the substrate material may also be vaporized if the focused beam is of a particularly high energy density.

SAND-75-5461 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Electron-Beam-Driven High-Power Hydrogen Fluoride Lasers.
J. B. Gerardo. 4p CONF-750520-4

Descriptors: (*Chemical lasers, *Performance), Electron beams, Excitation, Hydrofluoric acid, Pulses.

For abstract, see NSA 32 03, number 06252.

20F. Optics

AD-A013 585/5GA PC$3.25/MF$2.25
Metavac Inc Flushing N Y
Production Engineering Measures Infrared Filter for 1KW Searchlight AN/VSS-3A.
Quarterly rept. no. 4, 1 Mar-31 May 75,
John Monte. 10 Jul 75, 22p
Contract DAAB07-74-C-0379
See also report no. 3, AD-A010 359.

Descriptors: *Infrared filters, *Searchlights, Optical coatings, Optical filters, Substrates, Glass, Laboratory tests, Fabrication, Production engineering.
Identifiers: *Production engineering measures, AN/VSS-3A.

Combining the three pre-engineering filters made and factory tested during the last quarter with three additional filter assemblies, a group of six filter assemblies were gathered and submitted to factory level tests. All filters were

found to be satisfactory in their spectral transmission characteristics, their adhesion, and resistance to storage for periods of twenty-four hours at very high relative humidity. Three filters were selected and brought to Fort Belvoir, Virginia where a satisfactory night range is available for testing of visual security when mounted in a searchlight. Two filters were tested for total periods of about eighty hours, and one of them was dissembled and examined closely for signs or evidence of sealant or filter coating deterioration. It was judged that five filters could be selected and submitted to the Government as Engineering Samples.

AD-A013 590/5GA PC$3.75/MF$2.25
Maryland Univ College Park Dept of Physics and Astronomy
Double Scattering Correction in the Interpretation of Rayleigh Scattering Data Near the Critical Point of a Binary Liquid.
Technical rept.,
Alan J. Bray, and Ren-Fang Chang. May 75, 44p Rept no. TR-75-086
Contract N00014-67-A-0239-0014

Descriptors: *Rayleigh scattering, *Laser beams, Light scattering, Optical detectors, Refractive index, Liquids, Criticality, Temperature, Correlation techniques, Constants, Depolarization, Cancellation, Intensity, Scaling factors, Height, Geometric forms, Cross sections, Turbidity, Optical data, Mathematical models.
Identifiers: *Double scattering, *Binary liquids, Ornstein Zernike theory, Critical temperature.

Double scattering contributions to the intensity of Rayleigh-scattered light near the critical point of a binary liquid are calculated for 90 deg scattering. A family of sample geometrics is considered, namely cylinders with arbitrary length to radius ratio and cuboids with square cross-sections and arbitrary length to side ratio. For binary liquids with nearly matched refractive indices, these terms can be sufficiently large that they affect the interpretation of data with respect to the value of the critical exponent eta and the deviation of the correlation function from Ornstein-Zernike form, yet small enough that higher order contributions can be neglected. Numerical results are presented for all temperatures above T sub c together with analytical results in certain limiting cases. Near the critical point, the double scattered intensity is comparable with that lost through extinction and these two effects cancel in leading order. Some analytical results are also obtained for the depolarization ratio.

AD-A013 739/8GA PC$4.75/MF$2.25
Aerospace Corp El Segundo Calif Aerophysics Lab
Density Perturbations Induced by a Sluing Laser Beam.
Interim rept.,
John W. Ellinwood, Harold Mirels, and Robert L. Varwig. 15 Jul 75, 96p Rept no. TR-0076(6725)-1 SAMSO-TR-75-189
Contract F04701-75-C-0076

Descriptors: *Laser beams, *Thermal blooming, Atmospheric motion, Heat, Equations of state, Perturbations, Numerical analysis, Transonic flow, Chemical lasers, Hydrogen fluoride.
Identifiers: *Atmospheric transmissivity, Hydrogen fluoride lasers.

A theoretical and experimental investigation of the density perturbations induced by absorption in a sluing laser beam has been conducted with emphasis on transonic crossflows. A linearized theory for the time-dependent density perturbations induced after turning on an arbitrary heat distribution within an arbitrary crossflow has been developed and programmed for routine computations. A closed-form solution has been obtained for the special case of sonic crossflow (M = 1) and a uniform heat distribution. The limits of validity of the linearized theory are obtained for M near one and large time. An experiment was conducted to compare the density perturbations predicted by linearized theory with experimental observations. A cw HF laser beam was rotated across an absorption cell located within a Mach-Zehnder interferometer. Fringe shifts were observed, as predicted by linearized theory, when the crossflow (sluing rate) was subsonic. No fringe shifts were observed at transonic speeds partly because of the onset of nonlinear effects.

AD-A013 766/1GA PC$3.25/MF$2.25
Aerospace Corp El Segundo Calif Lab Operations
Addendum to: Band Model Formulation for Inhomogeneous Optical Paths.
Interim rept.,
Stephen J. Young. 31 Jul 75, 12p Rept no. TR-0076(6970)-3 SAMSO-TR-75-210
Contract F04701-75-C-0076, DARPA Order-2843
See also report dated 19 Dec 74, AD-A003 403.

Descriptors: *Band spectra, *Light transmission, Numerical analysis, Spectral lines, Absorption(Physical), Radiance.
Identifiers: Optical paths.

The statistical band model formulation for highly inhomogeneous optical paths presented in a previous paper is extended to the case where the strengths of lines in Delta nu are distributed according to a modified inverse probability function.

AD-A013 786/9GA PC$4.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Radiation Effects on Fiber Optics.
Physical sciences research papers (Final),
James A. Wall, and John F. Bryant. 2 Apr 75, 54p Rept nos. AFCRL-PSRP-627, AFCRL-TR-75-0190

Descriptors: *Optical materials, *Fiber optics, *Radiation effects, Optical communications, Glass fibers, Cesium, Doping, Transient radiation effects, X rays, Light transmission, Germanium, Fused silica, Plastics, Fluorescence, Neutron irradiation.

Samples representative of most of the optical fibers presently available in lengths of 10 m or more were tested for their responses to energetic radiation. Glass fibers doped with three different levels of cesium were also prepared and tested. Permanent and transient x-radiation effects tests were performed. Neutron effects tests were performed. All of the fibers tested showed decreases in transmission when exposed to radiation. All of the fibers emitted fluorescent light pulses when exposed to intense x-ray pulses.

AD-A013 922/0GA PC$6.25/MF$2.25
Intelcom Rad Tech San Diego Calif
Transient Radiation Effects in Optical Materials.
Final rept. Feb 74-30 Apr 75,
Michael J. Treadaway, Burr C. Passenheim, and Bob D. Kitterer. 29 Apr 75, 153p Rept no. INTEL-RT-6068-044 SAMSO-TR-75-174
Contract F04701-74-C-0237

Descriptors: *Optical materials, *Transient radiation effects, *Spacecraft components, Ionizing radiation, Light transmission, Color centers, Radioluminescence, Absorption(Physical), Optical glass, Fused silica, Quartz, Sapphire, Visible spectra, Ultraviolet spectra, Electron irradiation, Annealing.

The results of an extensive investigation of the optical response of thirteen common optical materials to 2.5-MeV electron irradiation is reported. Radiation-induced absorption and absolute radioluminescence yields were measured in the wavelength range 0.14 to 0.9 micrometers for dose rates between 0.05 to 0.00005 rad/sec at doses from 0.0023 to 0.00000045 rads. Sapphire, fused and crystalline quartz and ten Schott optical glasses were investigated. Determinations were made of (a) the absolute radioluminescence yield, (b) the dose rate dependence yield (c) the spectral and temporal distribution of the radioluminescence and induced absorption, (d) the growth curve of the induced absorption versus total dose, (e) the dose-rate dependence of the absorption, and (f) the bleaching of the absorption after irradiation. In addition, where available, samples from different melts were investigated to determine the variation in the above effects with manufacturing variation.

AD-A013 948/5GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Light Scattering Lineshape in Opaque Materials.
Journal article,
Gene Dresselhaus, and Alan S. Pine. 29 Oct 74, 4p Rept no. JA-4456 ESD-TR-75-199
Contract F19628-73-C-0002
Availability: Pub. in Solid State Communications, v16 n8 p1001-1004 1975.

Descriptors: *Light scattering, *Opacity, *Brillouin zones, Line spectra, Phonons, Optics, Reprints.
Identifiers: Opaque materials, Brillouin lineshapes.

The wavevector distribution excited by light scattering in opaque materials is calculated and compared to recently observed asymmetrical Brillouin lineshapes. (Author)

AD-A014 017/8GA PC$3.25/MF$2.25
Sun Oil Co Marcus Hook Pa Applied Research Dept
Infrared Emission Spectra of Liquids in a Diamond Anvil Cell by Interferometry,
James L. Lauer, and Melvin E. Peterkin. 10 Jul 74, 4p AFOSR-TR-75-1157
Contract F44620-74-C-0038
Availability: Pub. in Applied Spectroscopy, v29 n1 p78-79 Jan-Feb 75.

Descriptors: *Infrared spectroscopy, *Infrared spectrometers, Infrared spectra, Liquids, Microscopes, Absorption, Reprints.

An apparatus is described, which makes it possible to obtain with a Fourier spectrometer infrared emission spectra from very small liquid samples, such as those contained in a diamond anvil cell. Its principal component is an all-reflecting microscope objective lens forming an enlarged real image of the sample space in the normal location of the spectrometer source and thus providing a virtual source. The basic equivalence of emission and absorption spectra is illustrated. (Author)

AD-A014 043/4GA PC$3.75/MF$2.25
United Technologies Research Center East Hartford Conn
Influence of Beam Jitter on Thermal Blooming.
Semi-Annual technical rept., 6 Jan-30 Jun 75,
Frederick G. Gebhardt. 1 Aug 75, 44p Rept no. R75-922050-6
Contract N00014-75-C-0649, ARPA Order-2439

Descriptors: *Laser beams, *Thermal blooming, Atmospheric motion, Turbulence, Mathematical models, Absorption(Physical), Simulation.
Identifiers: Atmospheric transmissivity, Beam jitter, *Atmospheric attenuation.

Laboratory simulation experiments have been carried out to investigate the effects of beam jitter on the thermal blooming of a laser beam propagating in an absorbing medium with a transverse wind. Results obtained with a broadband, low pass white noise jitter frequency spectrum are in good agreement with the root-sum-square approach which considers the jitter and blooming effects to be independent. The effects of beam jitter on the scaling laws for thermal blooming are considered.

AD-A014 089/7GA PC$4.75/MF$2.25
Tennessee Univ Knoxville Ultrasonics Lab
Fraunhofer Diffraction of Light and of Ultrasonic Waves by Gratings having Multiple Periodicities.
Technical rept.,
Michael A. Torbett. Jun 75, 84p Rept no. TR-12
Contract N00014-71-A-0121-0001

Descriptors: *Diffraction gratings, *Light transmission, Coherent radiation, Ultrasonic radiation, Mathematical models, Fourier transformation, Computer applications, Optical properties, Acoustic properties.
Identifiers: *Fraunhofer diffraction.

The theory of Fraunhofer diffraction of light by coherently illuminated amplitude transmission gratings having an arbitrary number of periodicities has been developed by Fourier transform techniques. This mathematical description has been specialized for the case of a grating having a double periodicity. The resulting expression has been tested experimentally. In addition, the case of the singly-periodic grating was also considered. In each case agreement between theory and experiment was found to be reasonable in the lower diffraction orders. In the higher diffraction orders, the agreement was not as good. An ultrasonic schlieren apparatus made it possible to model the optical experiment with an analogous acoustical one. Photographs of the diffraction of ultrasonic waves by gratings having single and double periodicities were made. Qualitative comparison between the optical and acoustical configurations is made.

NTIS/PS-75/670/0GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Atmospheric Effects on Laser Beams (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
Mona F. Smith. Aug 75, 232p*
See also NTIS/PS-75/412.

Descriptors: *Bibliographies, *Laser beams, *Atmospheric attenuation, Atmospheric motion, Electrooptics, Aerosols, Light transmission, Turbulence, Optical communication, Infrared lasers, Infrared detectors, Air pollution, Atmospheric scattering, Computer aided analysis, Abstracts.
Identifiers: *Atmospheric transmissivity, Atmospheric windows, Air pollution detection.

Studies involving laser beam, transmission through the atmosphere are presented in this bibliography of Federally-funded research. Cited are the effects of atmospheric window flows, turbulence, aerosols, and molecular attenuation. Infrared lasers, computer simulation, electrooptics and optical communications are but a few areas studied in their relation to these effects. (Contains 227 abstracts) See also NTIS/PS-75/412, Light Communication Systems.

N75-26414/3GA PC$7.00/MF$2.25
General Dynamics/Convair, San Diego, Calif.
Design, Fabrication, and Test of a Graphite/Epoxy Metering Shell (Gems).
Final Report, Jun. 1973 - Apr. 1975.
Apr 75, 187p NASA-CR-143870, CASD-NAS-75-015
Contract NAS8-28201

Descriptors: *Cylindrical shells, *Epoxy resins, *Graphite, *Spaceborne telescopes, Design analysis, Fabrication, Shell stability, Thermal expansion, Vacuum chambers, Value engineering.

For abstract, STAR 1317

N75-26416/8GA PC$6.25/MF$2.25
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
Structural Evaluation of Candidate Designs for the Large Space Telescope Primary Mirror.
Research Report, 1 Jan. - 1 Sep. 1974.
K. Soosaar, R. Grin, M. Furey, and J. Hamilton.
Apr 75, 173p NASA-CR-143880, R-874
Contracts NAS8-29187, PROJ. 55-52100

Descriptors: *Design analysis, *Large space telescope, *Mirrors, *Structural design criteria, Finite element method, Fracture mechanics, Load distribution (Forces), Structural analysis.

For abstract, STAR 1317

N75-26417/6GA PC$5.75/MF$2.25
Draper (Charles Stark) Lab., Inc., Cambridge, Mass.
Analysis and Trade-off Studies of Large Lightweight Mirror Structures.
K. Soosaar, R. Grin, and F. Ayer. Apr 75, 150p
NASA-CR-143881, R-873
Contract NAS8-29187

Descriptors: *Large space telescope, *Mirrors, *Structural analysis, Astronomical telescopes, Design analysis, Honeycomb structures, Spaceborne telescopes, Structural reliability.

For abstract, STAR 1317

PATENT-3 733 138 Not available NTIS
Department of the Army Washington D C
Optical System for Inspection of a Cavity.
Patent,
Mark H. Weinberg. Filed 14 Jun 72, patented 15 May 73, 4p Rept nos. PAT-APPL-262 900,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Optical instruments, *Projectile cases, *Patents, Test equipment.
Identifiers: PAT-CL-356-241.

The present invention relates to an optical system for viewing a full 360 annular area on the inside of a cavity. The inspector can by simple longitudinal motion of the viewing instrument, relative to the cavity, rapidly inspect the interior surface without rotating the part being inspected. The design of the present device permits a brilliant light source to be used to illuminate either a broad or narrow band of wall surface. One of the objects of this invention is to provide an optical system for inspecting the interior of an artillery projectile.

Y-DA-5974 PC$4.00/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Improving a Production Lathe to Machine Optical Components for High-Energy Lasers.
H. L. Gerth. 12 May 75, 15p CONF-741108-5
Contract W-7405-eng-26

Descriptors: (*Laser mirrors, *Fabrication), (*Machine tools, *Performance), Metals.

For abstract, see NSA 32 03, number 06253.

Y-DA-5975 PC$4.25/MF$2.25
Oak Ridge Y-12 Plant, Tenn.
Diamond Turning on Advanced Machine Tool Prototypes.
J. B. Arnold, and P. J. Steger. 12 May 75, 21p
CONF-741108-4
Contract W-7405-eng-26

Descriptors: (*Laser mirrors, *Machining), (*Machine tools, *Performance), Aluminium, Copper, Gold, Metals, Silver.

For abstract, see NSA 32 03, number 06254.

20G. Particle Accelerators

AD-A013 904/8GA PC$3.25/MF$2.25
California Univ Berkeley Dept of Chemical Engineering
Semiclassical Trajectory Calculations of Helium Scattering from W(112),
Richard I. Masel, Robert P. Merrill, and William H. Miller. 14 Aug 74, 10p AFOSR-TR-75-1110
Grants AF-AFOSR-2218-72, NSF-GP-34199X
Availability: Pub. in Surface Science, v46 p681-688 1974.

Descriptors: *Molecular beams, *Particle trajectories, *Helium, *Tungsten, *Quantum theory, *Crystallography, Inelastic scattering, Neon, Metals, Surfaces, Diffraction, Potential energy, Gases, Solids, Interactions, Reprints.

Preliminary calculations of the semiclassical trajecotry theory are applied to He scattering from tungsten(112) in the azmuth(perpendicular to atomic ridges) and (parallel to the atomic ridges) direction. In the (110), perpendicular to the ridges, the calculations give a specular peak and two diffractive beams at the correct position and at approximately the relative intensities observed. In the (111) direction only the specular beam is predicted, again in agreement with the experiments.

AERE-M-2710 PC$4.00/MF$2.25
UKAEA Research Group, Harwell. Atomic Energy Research Establishment.
Feasibility of Obtaining Very Short Pulsed BEAMS in the Energy Range 300 to 600 Kev from the 3 Mev Pulsed van de Graaff Accelerator (I.B.I.S.).
D. R. Porter, and S. Waring. Mar 75, 12p
U.S. Sales Only.

Descriptors: (*Van de graaff accelerators, *Beam pulsers), (*Neutron sources, Beam pulsers), Deuteron beams, Deuteron reactions, Targets, Time resolution, Tritium.

For abstract, see NSA 32 03, number 07308.

BNL-20079 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Superconducting Wiggler Magnet for the Proposed Bnl Electron Storage Ring.
P. F. Dahl, and W. B. Sampson. 7 May 75, 8p

Descriptors: (*Superconducting magnets, *Design), (*Storage rings, Superconducting magnets), Accelerator facilities, Electrons, Planning, Synchrotron radiation.

For abstract, see NSA 32 03, number 07298.

CONF-750307-3 PC$4.00/MF$2.25
National Accelerator Lab., Batavia, Ill.
Simply Focused Neutrino BEAMS.
A. Benvenuti, D. Cline, and W. T. Ford. 7p

Descriptors: (*Neutrino beams, *Beam production), (*NaI synchrotron, Neutrino beams), Accelerator facilities, Focusing, Quadrupoles.

For abstract, see NSA 32 03, number 07309.

CONF-750335-51 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Design of the Zero Gradient Synchrotron Booster II Ring Magnet.
M. H. Foss, K. Thompson, R. J. Lari, and J. Simpson. 12 Mar 75, 5p
Contract W-31-109-Eng-38

Descriptors: (*Zgs, Beam focusing magnets), (*Particle boosters, Beam focusing magnets), (*Beam focusing magnets, *Design).

For abstract, see NSA 32 03, number 07263.

CONF-750335-53 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Transport of DC and Bunched BEAMS Through a 25 Mv Folded Tandem Accelerator.
W. T. Milner, G. D. Alton, D. C. Hensley, C. M. Jones, and R. F. King. 1975, 5p

Descriptors: (*Van de graaff accelerators, *Beam transport), (*Ornl isochronous cyclotron, *Beam injection), Beam acceptance.

For abstract, see NSA 32 03, number 07286.

CONF-750427-1 PC$4.50/MF$2.25
Oak Ridge National Lab., Tenn.
Ring Lens for Focusing Ion BEAMS to Uniform Densities.
C. H. Johnson. 1975, 28p

Descriptors: (*Electrostatic lenses, *Design), Beam optics, Focusing, Ion beams, Performance, Symmetry.

For abstract, see NSA 32 03, number 07287.

CONF-750438-1 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Graphic, Time-Sharing Magnet Design Computer Programs at Argonne.
R. J. Lari. 1974, 16p
Contract W-31-109-Eng-38

Descriptors: (*Zgs, Electromagnets), (*Computer codes, *G codes), (*Electromagnets, *Design), Beam bending magnets, Beam focusing magnets, M codes, T codes.

For abstract, see NSA 32 03, number 07264.

CONF-750444-1 PC$4.00/MF$2.25
Argonne National Lab., Ill.
Pulsed Magnet Systems for High Energy Physics Beam Lines.
W. F. Praeg. 1975, 9p
Contract W-31-109-Eng-38

Descriptors: (*Zgs, *Beam transport), (*Pulsed magnet coils, *Design), (*Septum magnets, Design), (*Beam focusing magnets, Design), Accelerator facilities, Beam bending magnets, Power supplies, Quadrupoles, Switches.

For abstract, see NSA 32 03, number 07265.

JINR-P13-8635 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Sawtooth Current Generator for Meson Beam Stretching System of the Jinr Synchrocyclotron.
V. I. Danilov, E. I. Rozanov, V. I. Smirnov, and A. V. Shestov. 1975, 10p
In Russian. U.S. Sales Only.

Descriptors: (*Dubna synchrocyclotron, *Power supplies), Beam pulsers, Electromagnets, Meson beams, Pulse generators, Thyristors.

For abstract, see NSA 32 03, number 07266.

JINR-P8-8602 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Liquid Hydrogen Target with a Minimum Amount of the Wall Matter at an Angle of 2 pi .
L. B. Golovanov, and V. L. Mazarskii. 1975, 9p
In Russian. U.S. Sales Only.

Descriptors: (*Hydrogen, Targets), (*Targets, *Design), Foams, Liquids, Specifications.

For abstract, see NSA 32 03, number 07310.

JINR-P9-8478 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Numerical Study of Electromagnetic Wave Scattering by a Longitudinal-Inhomogeneous Ring Bunch of Charged Particles in a Circular Waveguide.
A. B. Shvachka, and E. I. Urazakov. 1975, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Electromagnetic radiation, *Scattering), (*Waveguides, Electromagnetic radiation), Charged particles, Instability, Numerical solution, Resonance.

For abstract, see NSA 32 03, number 07289.

JINR-P9-8625 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Calculation of the Fields Excited by Moving Electron Bunch in Coaxial Cavity.
V. N. Mamonov, and S. B. Rubin. 1975, 17p
In Russian. U.S. Sales Only.

Descriptors: (*Cavity resonators, *Electromagnetic fields), Computer calculations, Electron beams, Excitation, Interactions.

For abstract, see NSA 32 03, number 07290.

KFK-2094 PC$10.25/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Experimentelle Kernphysik.
Phase Synchronization of Superconducting Accelerator Resonators.
G. Hochschild. Feb 75, 143p
In German. U.S. Sales Only.

Descriptors: (*Linear accelerators, Superconducting cavity resonators), (*Superconducting cavity resonators, *Tuning), Helical waveguides, Protons.

For abstract, see NSA 32 03, number 07267.

LA-tr-75-4 PC$4.00/MF$2.25
AN SSSR, Novosibirsk. Inst. Yadernoj Fiziki.
Surface-Plasma Source of Negative Ions with Penning Geometry.
V. G. Dudnikov. Jan 75, 11p
Translation by H.J. Dahlby of Poverkhnostno-plazmennyi istochnik otritsatel'nykh ionov s Penningovskoi geometriei.

Descriptors: (*Penning ion sources, *Design), (*Accelerators, Penning ion sources), (*Hydrogen ions 1 minus, Penning ion sources), (*Deuterium ions, Penning ion sources), Charge exchange, Ion sources, Plasma.

For abstract, see NSA 32 03, number 07283.

LBL-3369 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
New High Intensity K-Beam at the Bevatron.
C. Leemann, R. Morgado, and R. Sah. Mar 75, 8p CONF-750335-64
Contract W-7405-ENG-48

Descriptors: (*Bevatron, Kaon beams), (*Kaon beams, *Beam production), Accelerator facilities, Beam optics, Beam separators, Design, Electromagnetic lenses, Kaons plus, Performance, Quadrupoles.

For abstract, see NSA 32 03, number 07311.

LBL-3371 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Spill Control and Intensity Monitoring for the Bevatron--Bevalac External Particle BEAMS.
J. J. Barale, and K. C. Crebbin. Mar 75, 5p
CONF-750335-57
Contract W-7405-eng-48

Descriptors: (*Bevatron, *Beam monitoring), Accelerator facilities, Beam extraction, Beam monitors, Beam transport, Cherenkov counters, Control systems, Plastic scintillation detectors, Secondary emission detectors.

For abstract, see NSA 32 03, number 07269.

LBL-3433 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
High Charge State Heavy Ion Production from a Pig Source.
L. Bex, D. J. Clark, C. E. Ellsworth, W. S. Flood, and R. A. Gough. Mar 75, 11p CONF-750335-58
Contract W-7405-eng-48

Descriptors: (*Multicharged ions, Penning ion sources), (*Penning ion sources, *Performance), (*Uclrl cyclotrons, Penning ion sources), Argon ions, Heavy ions, Nitrogen ions.

For abstract, see NSA 32 03, number 07284.

LBL-3688 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Escar Superconducting Magnet System.
W. S. Gilbert, R. B. Meuser, W. L. Pope, and M. A. Green. 12 Mar 75, 5p CONF-750335-61
Contract W-7405-eng-48

Descriptors: (*Storage rings, Superconducting magnets), (*Superconducting magnets, *Design), Cryostats, Dipoles.

For abstract, see NSA 32 03, number 07299.

LBL-3824 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Feasibility and Advantages of Commercial Process I/O Systems for Accelerator Control.
R. A. Belshe, V. P. Elischer, and V. Jacobson. Mar 75, 7p CONF-750335-60
Contract W-7405-eng-48

Descriptors: (*Accelerators, *Control systems), Computers, Cost, Data transmission, Equipment interfaces.

For abstract, see NSA 32 03, number 07270.

NP-20397 PC$5.75/MF$2.25
Science Research Council, Daresbury (UK). Daresbury Lab.
Daresbury 1974.
1975, 52p
U.S. Sales Only.

Descriptors: (*Nina, *Research programs), (*Cern, Research programs), (*High energy physics, Research programs), (*United kingdom organizations, Research programs), Nuclear structure, Radiation sources,

Synchrotron radiation, Van de graaff accelerators.

No abstract available.

RL-74-153 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Improvements to Injection into Epic.
A. Carne. Nov 74, 9p
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Beam injection), Beam dynamics, Gev range 01-10, Magnets, Nimrod, Particle boosters, Planning, Rf systems, Specifications, Synchrotron oscillations.

For abstract, see NSA 32 03, number 07300.

RL-75-010 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Q Factor Measurements on Tank 1.
E. G. Sandels, and J. E. Ellis. Jan 75, 7p N/INJ-52
U.S. Sales Only.

Descriptors: (*Cavity resonators, *Quality factor), (*Nimrod, Cavity resonators), Measuring methods.

For abstract, see NSA 32 03, number 07271.

RL-75-013 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Shims for the Epic Prototype Dipole Magnet (Calculations).
A. G. Armstrong, J. Simkin, and C. W. Trowbridge. Mar 75, 5p EPIC/MC-69
U.S. Sales Only.

Descriptors: (*Epic storage ring, Electromagnets), (*Electromagnets, *Computer calculations), Colliding beams, Dimensions, Dipoles, G codes, Planning, Specifications, T codes.

For abstract, see NSA 32 03, number 07292.

RL-75-019 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Polarized Targets for Thermal Neutron BEAMS: A Review.
S. F. J. Cox. Jan 75, 15p
U.S. Sales Only.

Descriptors: (*Polarized targets, *Reviews), Magnetic dipoles, Neutron beams, Neutron diffraction, Neutron reactions, Nuclear alignment, Oriented nuclei, Research programs, Spin orientation, Thermal neutrons, Zeeman effect.

For abstract, see NSA 32 03, number 07314.

RL-75-021 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Longitudinal Head--Tail in Epic.
H. G. Hereward. Feb 75, 3p EPIC/MC-70
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Beam dynamics).

For abstract, see NSA 32 03, number 07301.

RL-75-022 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Rf Losses Due to Ripple in the Beam Induced Voltage.
M. H. R. Donald. Feb 75, 8p EPIC/MC-71
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Energy losses), Beam dynamics, Cavity resonators, Electric potential.

For abstract, see NSA 32 03, number 07302.

RL-75-028 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Computers for the Epic Control System.
R. Rosner. 30 Jan 75, 7p EPIC/MC-72
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Control systems), Communications, Computers, Equipment interfaces.

For abstract, see NSA 32 03, number 07303.

RL-75-031 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Notes on a Cornell-Type Injection Scheme for Use in Epic.
A. Carne, and G. H. Rees. Mar 75, 7p EPIC/MC-73
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Beam injection), Electron beams, Nimrod, Positron beams.

For abstract, see NSA 32 03, number 07304.

RL-75-043 PC$4.25/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Lecture Given at the Rutherford Lab. March 10, 1975.
J. D. Lawson. Mar 75, 21p
U.S. Sales Only.

Descriptors: (*Accelerators, *Electric fields), Feasibility studies, Laser radiation, Lasers.

For abstract, see NSA 32 03, number 07254.

RL-75-046 PC$4.00/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Possible Tigner-Type Filling Schemes for Epic.
N. M. King. Mar 75, 16p EPIC/MC-76
U.S. Sales Only.

Descriptors: (*Epic storage ring, *Beam injection), Beam bunching, Beam stacking, Positrons.

For abstract, see NSA 32 03, number 07305.

20H. Particle Physics

AD-A013 756/2GA PC$3.25/MF$2.25
California Univ Irvine Dept of Physics
Scattering of Polaritons by Point Defects in Spatially Dispersive Media,
R. Maddox, and D. L. Mills. 25 Jul 74, 9p
AFOSR-TR-75-1111
Grant AF-AFOSR-2018-71
Availability: Pub. in Physical Review B, v11 n6 p2229-2236, 15 Mar 75.

Descriptors: *Polartrons, *Elastic scattering, *Crystal structure, *Crystal defects, Electromagnetic fields, Light, Reflection, Surface properties, Raman spectroscopy, Infrared spectra, Transport properties, Phonons, Excitons, Isotropism, Gallium phosphides, Solid state physics, Reprints.
Identifiers: Spatial dispersions.

For a simple model, we study the scattering of a polariton from a static point defect, in the presence of spatial dispersion. The polariton is scattered elastically by the defect, and in analogy with the theory of the reflection of light from the surface of a spatially dispersive medium, there are several final states possible. For example, when the medium is isotropic (the case considered here), an incident transverse polariton scatters into two transverse polariton final states, and into a longitudinal polariton final state upon striking the defect. The contributions to the cross section from these various scattering processes has been evaluated numerically, for a simple model and parameters appropriate to GaP in the infrared. (Author)

AD-A013 757/0GA PC$3.25/MF$2.25
Yeshiva Univ New York Dept of Physics
Magnetic and Nonmagnetic Impurities in Two-Dimensional Metals,
Baruch Fischer, and Michael W. Klein. 19 Aug 74, 7p AFOSR-TR-75-1197
Grant AF-AFOSR-2430-73
Availability: Pub. in Physical Review B. v11 n5 p2025-2029, 1 Mar 75.

Descriptors: *Molecular electronics, Spatial distribution, Magnetic materials, Impurities, Spinning(Motion), Polarization, Thermodynamics, Nuclear magnetic resonance, Israel, Reprints.
Identifiers: Two dimensional metals.

We examine the spatial dependence of the spin polarization arising from a magnetic impurity as well as the impurity-impurity interaction for impurities dissolved in an idealized two-dimensional metal. We whow that the temperature and concentration dependence of the thermodynamic properties of a magnetic-impurity system dissolved in a two-dimensional metal will, in the molecular-field approximation, be identical with that dissolved in a three-dimensional system. Similarly, the distance dependence of the screening charge from a nonmagnetic impurity in a metal changes from a 1/r3 (times an oscillating function) dependence in three dimensions to a 1/r2 dependence in two dimensions.

AD-A014 013/7GA PC$3.25/MF$2.25
Air Force Cambridge Research Labs Hanscom AFB Mass
Double-Vertex Contribution to the Decay Rate of Orthopositronium,
Michael A. Stroscio. 13 Mar 75, 3p Rept no. AFCRL-TR-75-0408
Availability: Pub. in Physical Review A, v12 n1 p338-339 Jul 75.

Descriptors: *Positronium, *Decay schemes, Positrons, Standard deviation, Estimates, Numerical analysis, Errors, Computations, Diagrams, Pair production, Nuclear reactions, Half life, Reprints.
Identifiers: *Orthopositronium, Double vertex diagrams, Feynman diagrams.

The recently calculated decay rate of orthopositronium differs with the experimental value by 2 1/2 standard deviations. This communication reports a 100-fold improvement in the numerical error estimate for the double-vertex diagram contribution to the decay rate. This improvement reduces the numerical error estimate of the previously calculated decay rate of orthopositronium by 20%. This improvement of the double-vertex diagrams alone does not bring the experimental and calculated values in good agreement; however, the discrepancy is reduced. (Author)

ANL/HEP-CP-75-18 PC$4.00/MF$2.25
Argonne National Lab., Ill.
P--P Scattering-Amplitude Measurements with Polarized BEAMS and Polarized Targets at 2 to 6 Gev/C.
A. Yokosawa. 1975, 9p CONF-750309-2

Descriptors: (*Proton-proton interactions, *Scattering amplitudes), Differential cross sections, Gev range 01-10, Linear momentum, Polarization.

For abstract, see NSA 32 03, number 07491.

ANL/HEP-75-08 PC$4.25/MF$2.25
Argonne National Lab., Ill.
Study of Neutral Currents in the Argonne 12-Foot Bubble Chamber.
L. G. Hyman. 1975, 23p CONF-750307-4

Descriptors: (*Neutrino-proton interactions, Neutral currents), (*Neutral currents, Neutrino-neutron interactions), (*Neutrino-neutron interactions, Neutral currents), Bubble chambers, Gauge invariance, Kaons neutral short-lived, Lambda particles, Neutrinos, Neutrons, Particle production, Pions minus, Pions neutral, Pions plus, Protons, Signals.

For abstract, see NSA 32 03, number 07485.

BNL-19790 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Radiative Capture of Neutrons in the Kev Region.
R. C. Greenwood, R. E. Chrien, and K. Rimawi. 1975, 4p CONF-750303-56

Descriptors: (*Manganese 55, Neutron reactions), (*Gadolinium 154, Neutron reactions), (*Gadolinium 156, Neutron reactions), (*Neutron reactions, *Capture), Branching ratio, Energy-level transitions, Gadolinium 155, Gadolinium 157, Gamma radiation, Gamma spectra, Kev range 01-10, Kev range 10-100, Manganese 56.

For abstract, see NSA 32 03, number 07725.

BNL-19842 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Cluster States in Light Nuclei in a Folded Potential Model.
R. Buck, C. B. Dover, and J. P. Vary. Mar 75, 3p CONF-750447-1

Descriptors: (*Oxygen 16, *Energy levels), (*Neon 20, Energy levels), (*Light nuclei, *Nuclear structure), Bound state, Cluster model, Energy spectra, L-s coupling, Nitrogen 15, Oxygen 15, Resonance, Rotational states, Spin.

For abstract, see NSA 32 03, number 07830.

BNL-19956 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Low Energy Total Cross Section of exp 36 AR.
S. F. Mughabghab, and B. A. Magurno. 3 Mar 75, 3p CONF-750303-61

Descriptors: (*Neutron reactions, *Total cross sections), (*Argon 36, Neutron reactions), Bound state, Breit-wigner formula, Comparative evaluations, S waves.

For abstract, see NSA 32 03, number 07708.

BNL-19957 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Evidence for Valence Neutron Capture in S-Wave Neutron Capture in exp 38 AR and exp 54 Fe.
S. F. Mughabghab. 3 Mar 75, 5p CONF-750303-62

Descriptors: (*Argon 36, Neutron reactions), (*Iron 54, Neutron reactions), (*Neutron reactions, *Capture), (*Argon 37, *Energy levels), Correlations, Gamma radiation, Iron 55, S waves.

For abstract, see NSA 32 03, number 07709.

BNL-19958 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Neutron Cross Sections and Their Uncertainties Obtained from Nuclear Systematics.
S. Pearlstein. 3 Mar 75, 8p CONF-750303-63

Descriptors: (*Intermediate mass nuclei, Neutron reactions), (*Neutron reactions, *Charge-exchange reactions), Alpha particles, Comparative evaluations, Cross sections, Errors, Knock-out reactions, Least square fit, Neutrons, Nuclear models, Pickup reactions, Protons, Statistical models.

For abstract, see NSA 32 03, number 07760.

BNL-19959 PC$4.00/MF$2.25
Brookhaven National Lab., Upton, N.Y.
Parametric Fit of the Total Cross Section of exp 45 SC.
B. A. Magurno, and S. F. Mughabghab. 3 Mar 75, 8p CONF-750303-60

Descriptors: (*Scandium 45, Neutron reactions), (*Neutron reactions, *Total cross sections), Breit-wigner formula, Computer calculations, Computer codes, Multilevel analysis, R codes, Resonance, Spin.

For abstract, see NSA 32 03, number 07726.

CEA-CONF-2991 PC$4.00/MF$2.25
CEA Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France). Dept. de Physique Nucleaire.
Experiments with 1 Gev Protons.
J. Thirion. 1974, 12p CONF-7409109-1
U.S. Sales Only.

Descriptors: (*Proton reactions, *Elastic scattering), Gev range 01-10, Inelastic scattering, Reviews.

For abstract, see NSA 32 03, number 07492.

CERN-HERA-75-2 PC$20.25/MF$2.25
European Organization for Nuclear Research, Geneva (Switzerland).
Compilation of Differential Cross Sections pi - Induced Reactions.
E. Bracci, C. Burichetti, J. P. Droulez, E. Flaminio, and C. Preti. 28 Feb 75, 343p
U.S. Sales Only.

Descriptors: (*Pion-nucleon interactions, *Elastic scattering), Data compilation, Diagrams, Differential cross sections, Final-state interactions, Pions minus, Pions plus, Tables, Two-body problem.

For abstract, see NSA 32 03, number 07510.

CONF-750506-2 PC$5.00/MF$2.25
Oak Ridge National Lab., Tenn.
Nucleon--Meson Transport Calculations.
R. G. Alsmiller, Jr. 1975, 37p

Descriptors: (*Nuclear cascades, *Reviews), Mesons, Nucleons.

For abstract, see NSA 32 03, number 07575.

COO-1545-157 PC$4.00/MF$2.25
Ohio State Univ., Columbus Dept. of Physics.
Fermion Number in Supersymmetric Models.
G. B. Mainland, and K. Tanaka. 1975, 12p
Contract E(11-1)-1545

Descriptors: (*Particle models, *Fermions), Bosons, Conservation laws, Lagrangian function, Mass, Symmetry, Symmetry breaking.

For abstract, see NSA 32 03, number 07524.

COO-1545-158 PC$4.00/MF$2.25
Ohio State Univ., Columbus Dept. of Physics.
Measurement of the Polarization Parameter in Small Angle Proton--Proton Elastic Scattering at 6 Gev/C.
D. R. Rust, R. R. Crittenden, and A. Lesnik. Apr 75, 11p
Contract AT(11-1)-1545

Descriptors: (*Proton-proton interactions, *Elastic scattering), Gev range 01-10, Linear momentum, Linear momentum transfer, Polarization, Polarized beams.

For abstract, see NSA 32 03, number 07495.

COO-2114-21 PC$4.25/MF$2.25
Colorado Univ., Boulder Dept. of Physics and Astrophysics.
Elementary Particles and High Energy Phenomena. Progress Report, May 1974--April 1975.
U. Nauenberg, and D. F. Bartlett. May 75, 24p
Contract E(11-1)-2114

Descriptors: (*Kaons, *Research programs), Decay, Emission, Isospin, Kaons neutral long-lived, Kaons neutral short-lived, Kinetics, Matrix elements, Neutrons, Pions, Protons, Symmetry.

For abstract, see NSA 32 03, number 07486.

COO-2280-17 PC$7.50/MF$2.25
Northwestern Univ., Evanston, Ill. Technological Inst.
Interior Corner Problem for the Neutron Diffusion Equation.
E. H. Bareiss, and S. R. Vickery. Nov 74, 87p
Contract AT(11-1)-2280

Descriptors: Computer calculations, Eigenfunctions, Eigenvalues, Fourier analysis, Interfaces, Neutron diffusion equation, Neutron flux.

For abstract, see NSA 32 03, number 07675.

COO-2458-2 PC$4.00/MF$2.25
Rensselaer Polytechnic Inst., Troy, N.Y. Dept. of Nuclear Engineering.
Interactive Approaches to Evaluating Methods and Data for Self-Shielded Resonance Absorption.
M. Becker. 1975, 5p CONF-750323-1
Contract AT(11-1)-2458

Descriptors: (*Uranium 238, Neutron reactions), (*Neutron reactions, *Resonance absorption), Comparative evaluations, Data, Interactive display devices, Resonance integrals, Self-shielding.

For abstract, see NSA 32 03, number 07802.

COO-3071-121 PC$4.25/MF$2.25
Pennsylvania Univ., Philadelphia.
Observation of Prompt Muons from Nucleon--Nucleon Interactions.
D. Bintinger, D. Cheng, and A. K. Mann. 1974, 20p

Descriptors: (*Heavy leptons, *Particle production), (*Muons minus, Particle production), (*Muons plus, Particle production), Cross sections, Lifetime, Linear momentum, Mass, Muons, Nucleon-nucleon interactions, Pions.

For abstract, see NSA 32 03, number 07569.

COO-3071-122 PC$4.00/MF$2.25
Pennsylvania Univ., Philadelphia.
Limit on the Production Cross Section for Massive Leptons.
D. Bintinger, D. Cheng, and A. K. Mann. 1974, 13p

Descriptors: (*Heavy leptons, *Particle production), Cross sections, Gev range 01-10, Lifetime, Linear momentum, Lorentz invariance, Nucleon-nucleon interactions, Transverse momentum.

For abstract, see NSA 32 03, number 07487.

COO-3071-126 PC$4.00/MF$2.25
Pennsylvania Univ., Philadelphia Dept. of Physics.
Observation of New Particle Production by High Energy Neutrinos and Antineutrinos.
A. Benvenuti, D. Cline, and A. K. Mann. 1974, 12p

Descriptors: (*Muons, *Particle production), (*Elementary particles, *Decay), Antineutrinos, Gev range 01-10, Mass, Neutrino-nucleon interactions, Weak interactions.

For abstract, see NSA 32 03, number 07488.

COO-3244-37 PC$4.00/MF$2.25
Carnegie-Mellon Univ., Pittsburgh, Pa.
Charged Particle Emission Following Bombardment of Nickel with 220 Mev pi exp + .
J. F. Amann, P. D. Barnes, M. Doss, and S. A. Dytman. 1975, 2p CONF-750447-2

Descriptors: (*Magnesium, *Pion reactions), (*Nickel, Pion reactions), (*Silver, Pion reactions), (*Protons, *Particle production), Cross sections, Deuterons, Emission spectra, Helium 3, Mev range 100-1000, Pions plus, Tritons.

For abstract, see NSA 32 03, number 07728.

DESY-75/06 PC$4.50/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
Scaling of delta/sub E exp + E exp - Implies Hadrons/ in Asymptotically Nonfree Theories.
F. Gutbrod, and W. Kerler. Mar 75, 26p
U.S. Sales Only.

Descriptors: (*Electron-positron interactions, *Annihilation), Boundary conditions, Cross sections, Dimensions, Dyson representation, Perturbation theory, Photons, Propagator, Renormalization, Self-energy, Spectral functions.

For abstract, see NSA 32 03, number 07543.

DESY-75/07 PC$4.00/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
Muon Pair Production by E exp + E exp - Annihilation at the 3100 Mev Resonance. Dasp Collaboration.
W. Braunschweig, E. Koenigs, and C. L. Jordan. Mar 75, 11p
U.S. Sales Only.

Descriptors: (*Muons, *Pair production), (*Electron-positron interactions, *Annihilation), Angular distribution, Asymmetry, Cross sections, Gev range 01-10, Resonance particles.

For abstract, see NSA 32 03, number 07480.

DESY-75/08 PC$5.50/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
Bethe Salpeter Equation and the Relativistic Quark Model.
T. S. Eisenschitz. Apr 75, 27p
U.S. Sales Only.

Descriptors: (*Quark model, *Symmetry breaking), (*Electroproduction, *Matrix elements), Bethe-salpeter equation, Relativistic range, Rotation, Spin, Su-6 groups.

For abstract, see NSA 32 03, number 07631.

DESY-75/09 PC$4.00/MF$2.25
Deutsches Elektronen-Synchrotron (DESY), Hamburg (F.R. Germany).
Comment Concerning the Evaluation of the Cabibbo--Radicati Sum Rule.
H. Genz. Apr 75, 16p
U.S. Sales Only.

Descriptors: (*Photon-proton interactions, *Sum rules), (*N*resonances, *Photoproduction), Cross sections, Currents, Isovectors, N-1520 resonances, N-1688 resonances, Nucleons, Pions, Su-2 groups, Threshold energy, Time dependence.

For abstract, see NSA 32 03, number 07544.

EUR-5170e PC$5.50/MF$2.25
SEE CODE- 1910825 Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
Propagation of Coherent Electromagnetic Radiation in the Atmosphere.
G. Blaesser. 1974, 50p
U.S. Sales Only.

Descriptors: (*Electromagnetic radiation, *Wave propagation), Beams, Coherent radiation, Earth atmosphere, Impurities, Microwave radiation, Refraction, Scattering, Spherical configuration, Turbulence, Variations.

No abstract available.

EURFNR-1241 PC$5.45/MF$2.25
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. fuer Angewandte Kernphysik.
Kev Neutron Radiation Capture and Total Cross Section of exp 50 exp 52 exp 53 Cr, exp 54 exp 57 Fe, and exp 62 exp 64 Ni.
H. Beer, and R. R. Spencer. Oct 74, 57p KFK-2063
U.S. Sales Only.

Descriptors: (*Iron 54, *Neutron reactions), (*Nickel 62, Neutron reactions), (*Nickel 64, Neutron reactions), Correlations, Cross sections, Energy levels, Gamma radiation, Kev range 01-10, Kev range 10-100, Kev range 100-1000, Level widths, Resonance, Strength functions, Total cross sections, Capture, Chromium 50, Chromium 51, Chromium 52, Chromium 53, Iron 55, Nickel 63, Nickel 65, Transmission, Chromium 54, Iron 57, Iron 58.

For abstract, see NSA 32 03, number 07731.

FERMILAB-74/110-THY PC$4.00/MF$2.25
Fermi National Accelerator Lab., Batavia, Ill.
Some Considerations on eta /sub C/.
B. W. Lee, and C. Quigg. Dec 74, 4p

Descriptors: (*Eta mesons, *Decay), Mass, Parity, Particle production, Spin.

For abstract, see NSA 32 03, number 07512.

IS-M-31(Rev.) PC$4.00/MF$2.25
Argonne National Lab., Ill.
Gamma-Ray Multiplicity and gamma-Charged Particle Correlations in 200 Gev/C Pp Interactions.
E. W. Anderson, H. B. Crawley, W. J. Kernan, and F. Ogino. 17 Jun 74, 9p CONF-740713-40

Descriptors: (*Proton-proton interactions, *Inclusive interactions), Charged particles, Correlations, Gev range 100-1000, Linear momentum, Multiple production, Multiplicity.

For abstract, see NSA 32 03, number 07496.

IS-M-32 PC$4.00/MF$2.25
Ames Lab., Iowa.

Charged Particle Correlations in 200 and 300 Gev/C Pp Interactions.
E. W. Anderson, H. B. Crawley, W. J. Kernan, and F. Ogino. 1974, 7p CONF-740713-41

Descriptors: (*Proton-proton interactions, *Correlations), Bubble chambers, Charged particles, Correlation functions, Functions, Gev range 100-1000, Linear momentum, Spark chambers.

For abstract, see NSA 32 03, number 07497.

ITP-74-107E PC$4.75/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Angular Momentum Reduction in the Four-Body Problem.
V. F. Kharchenko, and S. A. Shadchin. 1974, 35p
U.S. Sales Only.

Descriptors: (*Four-body problem, *Angular momentum), (*Bosons, Four-body problem), Equations of motion, Faddeev equations, Integral equations, Kernels, Rotation, Two-body problem.

For abstract, see NSA 32 03, number 07637.

ITP-74-109P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
New Axiomatic Restrictions on the Differential and Total Cross Sections.
Yu. M. Lomsadze, and V. I. Kelemen. 1974, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Cross sections), Boundary conditions, Differential cross sections, Pions minus, Pions plus, Quantum field theory, Scattering amplitudes, Total cross sections.

For abstract, see NSA 32 03, number 07607.

ITP-74-131E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Reduction Formula in General Bogolyubov'S Axiomatic Approach.
E. P. Sabad, Yu. M. Lomsadze, and B. A. Agranovskii. 1974, 15p
U.S. Sales Only.

Descriptors: Functionals, Mathematical operators, Quantum field theory, Scattering amplitudes, Two-body problem.

For abstract, see NSA 32 03, number 07638.

ITP-74-141E PC$5.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Representations of Lie Groups U(N,I), Iu(N) and Their Algebras. I.
A. U. Klimyk, and V. A. Shirokov. 1974, 40p
U.S. Sales Only.

Descriptors: (*Lie groups, *Irreducible representations), (*U groups, Irreducible representations), Algebra, Multiple production, Multiplicity, Unitary symmetry.

For abstract, see NSA 32 03, number 07629.

ITP-74-146P PC$4.25/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Pi pi -Scattering in Dual Model with Pomeron.
I. Yu. Krivskii, A. I. Lend'el, and V. I. Lend'el. 1974, 21p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-pion interactions, *Scattering lengths), Dual resonance model,

Duality, Mandelstam representation, Pomeranchuk particles, Regge trajectories, Resonance particles, Rho-765 resonances, S waves, Unitarity.

For abstract, see NSA 32 03, number 07591.

ITP-74-166E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Dipole Pomeron and Structure in Pp-Scattering.
L. L. Jenkovszky, and A. N. Wall. 1974, 11p
U.S. Sales Only.

Descriptors: (*Proton-proton interactions, *Pomeranchuk particles), Differential cross sections, Dipoles, Linear momentum.

For abstract, see NSA 32 03, number 07619.

ITP-74-42E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Weak Asymptotic Expansion of Coefficient Functions at Infinite Volume.
S. S. Ivanov. 1974, 20p
U.S. Sales Only.

Descriptors: (*S matrix, *Perturbation theory), Boundary conditions, Euclidean space, Functions, Series expansion, Volume.

For abstract, see NSA 32 03, number 07636.

ITP-74-71E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Decay Properties of Dual Fixed-Spin Resonances.
V. I. Makarov. 1974, 14p
U.S. Sales Only.

Descriptors: (*Resonance particles, *Decay), Dual resonance model, Duality, Energy spectra, Mass, Multiple production, Multiplicity, Particle widths, Spin, Statistics.

For abstract, see NSA 32 03, number 07577.

ITP-75-3E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Substantiation of the Hartree--Fock Method for Bose- and Fermi-Systems.
I. V. Simenog. 1975, 8p
U.S. Sales Only.

Descriptors: (*Many-body problem, *Hartree-fock method), Bosons, Boundary conditions, Fermions.

For abstract, see NSA 32 03, number 07639.

JINR-E1-8694 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Backward Proton Emission from the Reaction pi exp + + Xe at 2.34 Gev/C.
B. Slovinskii, Z. Strugal'skii, and B. Srednyava. 1975, 21p
U.S. Sales Only.

Descriptors: (*Xenon, *Nuclear structure), Angular distribution, Cluster model, Cross sections, Energy spectra, Gev range 01-10, Linear momentum, Lorentz invariance, Particle production, Pion reactions, Protons, Surfaces.

For abstract, see NSA 32 03, number 07513.

JINR-E2-8542 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Tauberian Theorems and Inclusive Processes.
S. Berceanu. 1975, 13p
U.S. Sales Only.

Descriptors: (*Inclusive interactions, *Structure functions), Boundary conditions, Diffraction models, Multiplicity, Scale invariance, Transverse momentum.

For abstract, see NSA 32 03, number 07527.

JINR-E2-8544 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Classification of Model Predictions on Asymptotic Behavior of Multiplicity Moments.
S. Berceanu. 1975, 12p
U.S. Sales Only.

Descriptors: (*Multiple production, *Boundary conditions), (*Particle models, Multiple production), Functions, Multiplicity.

For abstract, see NSA 32 03, number 07528.

JINR-E2-8549 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Delta delta -Plot.
G. I. Kopylov. 1975, 15p
U.S. Sales Only.

Descriptors: (*Pions, *Multiple production), Diagrams, Interference, Space-time.

For abstract, see NSA 32 03, number 07592.

JINR-E2-8594 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Dynamics of Constituent and Current Quarks.
A. P. Kobushkin, and V. P. Shelest. 1975, 13p
U.S. Sales Only.

Descriptors: (*Quarks, *Kinetics), Bound state, Currents, Particle interactions, Relativistic range.

For abstract, see NSA 32 03, number 07529.

JINR-E2-8656 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Interpretation of psi-Mesons in the Three-Triplet Model with Integral Charges.
S. B. Gerasimov, and A. B. Govorkov. 1975, 13p
U.S. Sales Only.

Descriptors: (*Psi-3105 resonances, *Multiplets), (*Psi-3695 resonances, Multiplets), Electric charges, Integrals.

For abstract, see NSA 32 03, number 07593.

JINR-E2-8678 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Asymptotic Relations Between the Proton Form Factors and Elastic Scattering of Polarized Leptons on Polarized Protons.
S. I. Bilenkaya, S. M. Bilenkii, A. Frenkel, and E. H. Hristova. 1975, 13p
U.S. Sales Only.

Descriptors: (*Protons, *Form factors), (*Lepton-nucleon interactions, *Elastic scattering), Asymmetry, Boundary conditions, Cross sections, Leptons, Polarization.

For abstract, see NSA 32 03, number 07572.

JINR-E7-8616 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Quasimolecular Kx-Ray Excitation by Bombarding Zr, NB, and Mo Targets with 96 Mev NB Ions.
W. Frank, P. Gippner, K. H. Kaun, H. Sodan, and W. Schulze. 1975, 10p
U.S. Sales Only.

Descriptors: (*Niobium ions, *Heavy ion reactions), (*Niobium 93, Heavy ion reactions), (*Molybdenum, Heavy ion reactions), (*Zirconium, Heavy ion reactions), Adiabatic processes, Mev range 10-100, Nuclear molecules, X-ray spectra.

For abstract, see NSA 32 03, number 07762.

JINR-P1-8662 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Central Collision of Relativistic Nuclei.
K. D. Tolstov. 1975, 11p
In Russian. U.S. Sales Only.

Descriptors: Central potential, Nuclear models, Nuclear reactions, Relativistic range.

For abstract, see NSA 32 03, number 07833.

JINR-P1-8666 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Hyperon Polarization in pi exp - -p Interactions at 5 Gev/C.
V. V. Glagolev, A. A. Kuznetsov, G. D. Pestova, and M. Sabeu. 1975, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Lambda particles, *Polarization), (*Sigma minus, Polarization), (*Sigma plus, Polarization), (*Pion-proton interactions, *Inclusive interactions), Differential cross sections, Fragmentation, Gev range 01-10, Linear momentum, Pions minus, Targets, Two-body problem.

For abstract, see NSA 32 03, number 07500.

JINR-P1-8677 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Charge Exchange in pi exp - N Interactions at 40 Gev/C.
N. Angelov, L. Aniola, I. A. Ivanovskaya, E. N. Kladnitskaya, and N. N. Mel'nikova. 1975, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-neutron interactions, *Charge-exchange interactions), (*Kaon-proton interactions, Charge-exchange interactions), (*Proton-proton interactions, Charge-exchange interactions), Distribution, Gev range 10-100, Gev range 100-1000, Kaons plus, Linear momentum, Multiperipheral model, Multiple production, Pions minus.

For abstract, see NSA 32 03, number 07608.

JINR-P1-8699 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Four-Prong pi exp - p Interactions with pi exp 0 Production at 5 Gev/C. 1. Experimental Procedure; Cross Section Determination by Kinematical Identification of Events.
N. S. Amaglobeli, Yu. A. Budagov, and V. B. Vinogradov. 1975, 17p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Cross sections), Gev range 01-10, Kinetics, Linear momentum, Pions minus, Pions neutral, Pions plus.

For abstract, see NSA 32 03, number 07514.

JINR-P1-8702 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Interaction Cross Sections for Unstable Particles from the Data on pi exp - C-Collisions at 5 Gev.
N. S. Amaglobeli, Yu. A. Budagov, and V. B. Vinogradov. 1975, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Carbon, *Pion reactions), (*Meson-nucleon interactions, *Cross sec-

tions). (*Baryon-baryon interactions, Cross sections), A1r1070 resonances, Delta-1236 resonances, Gev range 01-10, Meson resonances, Nucleons, Pions minus, Resonance.

For abstract, see NSA 32 03, number 07515.

JINR-P10-8545 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Programs of Kinematic Identification of Single Vertex Events and V exp 0 Particles.
N. A. Buzdavina, L. Dorzh, A. G. Zaikina, V. G. Ivanov, and Yu. F. Lomakin. 1975, 21p
In Russian. U.S. Sales Only.

Descriptors: (*Bubble chambers, *Data processing), (*Computer codes, *A codes), (*Proton-antiproton interactions, *Particle identification), Hydrogen, K codes, Propane, Resonance particles.

For abstract, see NSA 32 03, number 07501.

JINR-P11-8701 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Quasistationary States Calculated within the Phase Equations in the R-Matrix Scattering Theory.
E. P. Zhidkov, I. V. Puzynin, and R. M. Yamaleev. 1975, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Scattering, *R matrix), Functionals, Nonlinear problems, Schroedinger equation.

For abstract, see NSA 32 03, number 07645.

JINR-P2-8444 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Lab. of Theoretical Physics.
Reaction pi exp - p implies N gamma gamma ' At Low Energies. 1. Calculation of the Simplest Pole Diagrams.
M. Vishinesku, and V. Dubovik. 1974, 17p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-proton interactions, *Regge poles), Delta-1236 resonances, Diagrams, Neutrons, Particle production, Photons, Pions minus.

For abstract, see NSA 32 03, number 07609.

JINR-P2-8557 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Multiplicity of Secondary Particles in Inclusive Hadron--Nucleus Reactions.
V. G. Grishin, S. M. Eliseev, and T. Ya. Inogamova. 1975, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Nuclear reactions, *Inclusive interactions), Cross sections, Hadrons, Many-body problem, Multiple production, Multiplicity, Nuclear cascades, Nuclear models.

For abstract, see NSA 32 03, number 07834.

JINR-P2-8568 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Low-Energy pi pi Scattering and the Pion Electromagnetic Form Factor.
V. G. Malyshkin. 1975, 24p
In Russian. U.S. Sales Only.

Descriptors: (*Pion-pion interactions, *Phase shift), (*Pions, *Electromagnetic form factors), Lagrangian function, P waves, Perturbation theory, Renormalization, S waves, Scattering amplitudes.

For abstract, see NSA 32 03, number 07595.

JINR-P2-8588 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Quark Interchange in Processes with Large Momentum Transfer Between Mesons and Baryons.
A. L. Lyubimov. 1975, 17p
In Russian. U.S. Sales Only.

Descriptors: (*Meson-baryon interactions, *Elastic scattering), (*Quark model, Meson-baryon interactions), Cross sections, Exchange interactions, Linear momentum transfer, Quarks.

For abstract, see NSA 32 03, number 07578.

JINR-P2-8647 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Mechanism of the psi-Meson Decay Suppression.
A. V. Efremov. 1975, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Psi-3105 resonances, *Decay), (*Psi-3695 resonances, Decay), Boundary conditions, Coupling constants, Decay amplitudes, Diagrams, Distance, Electric charges, Group theory, Mass, Phi-1019 resonances, Quantum numbers, Quarks, Reaction kinetics, Renormalization, Resonance particles, Scale invariance.

For abstract, see NSA 32 03, number 07594.

JINR-P2-8655 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Compton-Effect on Kaon.
M. K. Volkov, and V. N. Pervushin. 1975, 13p
In Russian. U.S. Sales Only.

Descriptors: (*Photon-meson interactions, *Compton effect), (*Kaons, *Polarizability), Chirality, Quantum field theory, Scattering amplitudes.

For abstract, see NSA 32 03, number 07547.

JINR-P2-8682 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Covariant Quasipotential Formalism for Two-Particle Bound State Reactions.
A. M. Kotsinyan. 1975, 21p
In Russian. U.S. Sales Only.

Descriptors: (*Potential scattering, *Bound state), Particle models, Relativistic range, Two-body problem, Wave functions.

For abstract, see NSA 32 03, number 07640.

JINR-P3-8458 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Measurement of the Spin-Dependent Neutron Scattering Amplitudes of exp 159 TB by Neutron Diffraction in Antiferromagnet at Ultra Low Temperatures.
G. G. Akopyan, V. P. Alfimenkov, L. Lason, O. N. Ovchinnikov, and E. I. Sharapov. 1975, 16p
In Russian. U.S. Sales Only.

Descriptors: (*Terbium 159, Neutron reactions), (*Neutron reactions, *Scattering), Antiferromagnetic materials, Cross sections, Helium dilution refrigeration, Neutron diffraction, Scattering amplitudes, Ultralow temperature.

For abstract, see NSA 32 03, number 07781.

JINR-P4-8416 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Lab. of Theoretical Physics.
Role of Nonadiabatic Effects in the Coulomb Interaction of Complex Nuclei.
R. V. Dzholos, and V. P. Permyakov. 1974, 21p
In Russian. U.S. Sales Only.

Descriptors: Collective model, Coulomb field, Heavy ion reactions, Nuclear potential, Unitarity.

For abstract, see NSA 32 03, number 07835.

JINR-P4-8475 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Lab. of Theoretical Physics.
High-Energy Potential Scattering Theory and the Phase Function Method.
M. Kh. Khankhasaev. 1974, 17p
In Russian. U.S. Sales Only.

Descriptors: (*Potential scattering, *Scattering amplitudes), Eikonal approximation, Functions.

For abstract, see NSA 32 03, number 07641.

JINR-P4-8580 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Integral Equation for the Wave Function of Three Identical Particles in the Boundary Condition Model. 1. Two-Particle Problem. Schroedinger and Faddeev Equations for Three Particles.
V. N. Efimov. 1975, 17p
In Russian. U.S. Sales Only.

Descriptors: (*Three-body problem, *Wave functions), Boundary conditions, Faddeev equations, Integral equations, Particle models, S matrix, Schroedinger equation.

For abstract, see NSA 32 03, number 07642.

JINR-P4-8591 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Exactly Soluble Model for Volume Conserving Pairing.
E. B. Bal'butsev, and M. Ploshaichak. 1975, 12p
In Russian. U.S. Sales Only.

Descriptors: Conservation laws, Energy, Equilibrium, Fermi level, Nuclear structure, Volume.

For abstract, see NSA 32 03, number 07836.

JINR-P4-8611 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Study of Vibrational State Unharmonicity in Strongly Deformed Nuclei.
G. Kyrchev, V. G. Solov'ev, and Ch. Stoyanov. 1975, 13p
In Russian. U.S. Sales Only.

Descriptors: (*Even-even nuclei, *Vibrational states), (*Deformed nuclei, Vibrational states), Phonons, Wave functions, Woods-saxon potential.

For abstract, see NSA 32 03, number 07837.

JINR-P4-8640 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Example of the Reconstruction of a Potential Using Resonance Positions Only.
B. N. Zakhar'ev, B. V. Rudyak, A. A. Suz'ko, and I. B. Ushakov. 1975, 13p
In Russian. U.S. Sales Only.

Descriptors: (*Potential scattering, *Resonance), Eigenvalues, Energy spectra, R matrix, Schroedinger equation, Symmetry.

For abstract, see NSA 32 03, number 07643.

JINR-P4-8744 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Quasiclassical Scattering Amplitude in the High-Energy Approximation.
V. K. Lukyanov. 1975, 16p
In Russian. U.S. Sales Only.

Descriptors: Glauber theory, Scattering amplitudes, Semiclassical approximation, Three-dimensional calculations.

For abstract, see NSA 32 03, number 07644.

LBL-3487 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Recent Multinucleon Transfer Experiments with Heavy Ions at Berkeley.
B. G. Harvey. Apr 75, 13p CONF-750447-3
Contract W-7405-ENG-48

Descriptors: (*Heavy ion reactions, *Multinucleon transfer reactions), Four-nucleon transfer reactions, Reviews, Three-nucleon transfer reactions, Two-nucleon transfer reactions.

For abstract, see NSA 32 03, number 07763.

LBL-3687 PC$4.00/MF$2.25
California Univ., Berkeley Lawrence Berkeley Lab.
Some Properties of the psi(3.7) Resonance, and Features of the Total Hadronic Cross Section in E exp + E exp - Annihilation from 2.4 Gev to 5.0 Gev C.M. Energy.
J. A. Kadyk, G. S. Abrams, and D. D. Briggs. 25 Apr 75, 19p CONF-750309-1, CONF-750307-5
Contract W-7405-eng-48

Descriptors: (*Psi-3695 resonances, *Particle widths), (*Electrons, Particle widths), Boundary conditions, Branching ratio, Cross sections, Decay, G-parity invariance, Psi-3105 resonances.

For abstract, see NSA 32 03, number 07596.

NBI-HE-74-18 PC$4.50/MF$2.25
Goeteborg Univ. (Sweden). Institutionen foer Teoretisk Fysik.
Two Mass Relations for Mesons from String: Quark Duality.
L. Brink, and H. B. Nielsen. Dec 74, 29p

Descriptors: (*Mesons, *Mass formulae), (*String models, *Su-6 groups), Boundary conditions, Duality, Mass, Propagator, Quantum numbers, Quarks, Wave functions.

For abstract, see NSA 32 03, number 07597.

NEANDC-99-U PC$5.75/MF$2.25
European American Nuclear Data Committee.
Summary Record of the Seventeenth Meeting (Technical Sessions), Tokyo, Japan, 24--29 March 1974.
H. Conde. 1974, 54p
U.S. Sales Only.

Descriptors: (*Nuclear data collections, *Meetings), (*Nuclear reactions, *Cross sections), (*Biology, Nuclear data collections), (*Medicine, Nuclear data collections), Data compilation, International cooperation, Safeguards, Thermonuclear reactors.

For abstract, see NSA 32 03, number 07764.

ORO-3948-07 PC$5.25/MF$2.25
Houston Univ., Tex.
Pion Interactions at Medium Energies. Progress Report, September 1, 1974--August 31, 1975.
J. C. Allred, B. W. Mayes, II, and E. V. I Hungerford, II. 1975, 41p
Contract AT(40-1)-3948

Descriptors: (*Radiation detectors, *Research programs), (*Nuclear reactions, Research programs), Breakup reactions, Calcium 40, Carbon 12, Design, Deuterium, Hydrogen, Lead 208, Mev range 100-1000, Oxygen 16, Pion reactions, Pions plus, Proportional counters, Proton reactions, Scintillation counters.

For abstract, see NSA 32 03, number 07765.

ORO-3992-213 PC$4.00/MF$2.25
Texas Univ., Austin Center for Particle Theory.
Lepton G-2 in a Dual Gauge Model.
D. A. Dicus. 1974, 10p CPT-258
Contract AT(40-1)-3992

Descriptors: (*Pions neutral, *Decay), Emission, Parity, Photons, Quark model.

For abstract, see NSA 32 03, number 07549.

ORO-4856-10 PC$4.00/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.
Experimental Test of Charge Conservation and the Stability of the Electron.
R. I. Steinberg, K. Kwiatkowski, W. Maenhaut, and N. S. Wall. Apr 75, 12p
Contract AT(40-1)-4856

Descriptors: (*Electrons, *Stability), Atoms, Auger effect, Boundary conditions, C invariance, Electric charges, Germanium, Lifetime, X radiation.

For abstract, see NSA 32 03, number 07481.

ORO-4856-7 PC$4.50/MF$2.25
Maryland Univ., College Park Dept. of Physics and Astronomy.
Field--Theoretic Low Equation Approach to Pion--Nucleus Scattering.
J. B. Cammarata, and M. K. Banerjee. Apr 75, 30p

Descriptors: (*Carbon 12, Pion reactions), (*Pion reactions, *Elastic scattering), Absorption, Crossing symmetry, Delta-1236 resonances, Ground states, Integral equations, Iterative methods, Low equation, Nonlinear problems, Obe model, Parity, Partial waves, Scattering amplitudes, Singularity, Spin, Unitarity.

For abstract, see NSA 32 03, number 07621.

RL-75-011 PC$4.50/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
The Budding Pomeron in the Tree Approximation to pi pi Inelastic Channels.
M. R. Pennington. Jan 75, 28p T-104
U.S. Sales Only.

Descriptors: (*Pion-pion interactions, *Pomeranchuk particles), (*A1-1070 resonances, *Decay), (*Rho-765 resonances, *Particle production), Coupling, Cross sections, Diagrams, Factorization, Meson-meson interactions, Pions plus.

For abstract, see NSA 32 03, number 07598.

RL-75-055 PC$4.50/MF$2.25
Science Research Council, Chilton (UK). Rutherford Lab.
Kaon-Nucleon Partial Wave Amplitudes Below 1.5 Gev/C for I = 0 and 1.
B. R. Martin. Mar 75, 29p
U.S. Sales Only.

Descriptors: (*Kaon-nucleon interactions, *Scattering amplitudes), (*Kaon-deuteron interactions, *Phase shift), (*Kaon-proton interactions, Phase shift), Deuterium, Gev range 01-10, Isospin, Kaon reactions, Kaons plus, Linear momentum, Partial waves.

For abstract, see NSA 32 03, number 07610.

UCID-16679 PC$4.75/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Neutron Reactions on exp 239 U.
D. G. Gardner. 24 Apr 75, 33p
Contract W-7405-Eng-48

Descriptors: (*Uranium 239, Neutron reactions), (*Neutron reactions, *Capture), (*Uranium 240, *Energy levels), C codes, Computer calculations, Computer codes, Cross sections, Elastic scattering, F codes, Fission, Inelastic scattering, U codes, Uranium 238.

For abstract, see NSA 32 03, number 07804.

UCID-16728 PC$5.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Comparison of Calculated and Experimental Neutron Spectra from the LII Pulsed Sphere Program Using the Tart Monte Carlo Code and the LII Evaluated Nuclear Data Library.
R. J. Howerton. May 72, 37p
Contract W-7405-eng-48

Descriptors: (*Water, *Neutron spectra), (*Heavy water, Neutron spectra), (*Lithium 6, Neutron spectra), (*Lithium 7, Neutron spectra), Aluminium, Beryllium 9, Carbon, Comparative evaluations, Computer calculations, Iron, Lead, M codes, Magnesium, Monte carlo method, Neutron reactions, Nitrogen, Nuclear data collections, Plutonium 239, Pulsed neutron techniques, Spheres, T codes, Titanium, Uranium 235, Uranium 238.

For abstract, see NSA 32 03, number 07678.

UCRL-50400(V.16) PC$10.60/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Integrated System for Production of Neutronics and Photonics Calculational Constants. Volume XVI. Tabular and Graphical Presentation of 175 Neutron Group Constants Derived from the LII Evaluated Neutron Data Library (Endl).
E. F. Plechaty, D. E. Cullen, R. J. Howerton, and J. R. Kimlinger. 29 Jan 75, 355p
Contract W-7405-Eng-48

Descriptors: (*Neutron transport theory, *Group constants), Gamma transport theory, Multigroup theory, Neutrons, Tables.

For abstract, see NSA 32 03, number 07679.

UCRL-51759 PC$7.60/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Calculated Apparent Yields of Rare Gas Fission Products.
A. A. Delucchi. 25 Feb 75, 261p
Contract W-7405-Eng-48

Descriptors: (*Uranium 235, *Neutron reactions), (*Uranium 238, Neutron reactions), (*Plutonium 239, Neutron reactions), Accuracy, Computer calculations, Computer codes, E codes, Fast fission, Fission neutrons, Fission yield, Isomeric nuclei, Krypton 85, Xenon 131, Xenon 133, Xenon 135.

For abstract, see NSA 32 03, number 07805.

UCRL-75991 PC$4.50/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Use of Nuclear Reaction Models in Cross Section Calculations.
S. M. Grimes. Mar 75, 27p CONF-741088-2

Descriptors: Computer calculations, Computer codes, Cross sections, Mev range, Neutron reactions, Nuclear models, Nuclear reactions, Reliability.

For abstract, see NSA 32 03, number 07838.

UCRL-76629 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Tabular Cross Section File Generation and Utilization Techniques.
D. E. Cullen, O. Ozer, and C. R. Weisbin. Mar 75, 5p CONF-750303-48

Descriptors: (*Nuclear reactions, *Cross sections), (*Nuclear data collections, *Data processing), Algorithms, Tables.

For abstract, see NSA 32 03, number 07766.

WANL-TME-1498 PC$5.25/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Status Report on the B1t Program. Provides Thermal--Neutron Flux and Current Spectra, Isotropic and Anisotropic Group Cross Sections.
G. Gibson, and G. Collier. Aug 66, 42p

Descriptors: (*Neutron transport theory, Computer codes), (*Computer codes, *B codes), (*Neutron spectra, Computer codes), Boltzmann equation, Computer calculations, Cross sections, Neutron flux, Neutron reactions, P1-approximation, Thermal neutrons.

For abstract, see NSA 32 03, number 07680.

WANL-TMI-866 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Ne 8020 a: Revision of Crsave.
L. I. Ortenberg. 14 Nov 63, 7p

Descriptors: (*Computer codes, *C codes), (*Neutron transport theory, Computer codes), Two-dimensional calculations, Weighting functions.

For abstract, see NSA 32 03, number 07681.

WANL-TMI-962 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Transport Cross Section in the GAM Program.
C. A. Stevens. 5 Feb 64, 5p

Descriptors: (*Neutron transport theory, Computer codes), (*Computer codes, *G codes), Computer calculations, Cross sections, Multigroup theory, Weighting functions.

For abstract, see NSA 32 03, number 07682.

WANL-TMI-988 PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Correspondence Between GAM and Dsn Cross Sections.
C. A. Stevens. 26 Feb 64, 5p

Descriptors: (*Neutron transport theory, Computer codes), (*Computer codes, *D codes), Comparative evaluations, Computer calculations, Cross sections, G codes.

For abstract, see NSA 32 03, number 07683.

20I. Plasma Physics

AD-A013 637/4GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
A Time Resolved Pinhole Camera for Observation of Nanosecond Duration XUV Plasma Emission.
Memorandum rept.,
David J. Johnson, Stavros J. Stephanakis, and John R. Boller. Jun 75, 12p Rept no. NRL-MR-3065

Descriptors: *Plasmas(Physics), *Electron beams, *Emission spectra, Soft x rays, Far ultraviolet radiation, Exploding wires, Image converters, Photoelectrons.
Identifiers: *Pinhole cameras, Pinholes.

A vacuum diode with rear mounted Pilot-B scintillator has been coupled with a conventional evacuated pinhole camera. The cathode of the diode is fabricated from 2 micrometer thick polycarbonate (Kimfol) with a 200 A aluminum layer on the rear surface. Incident photons with energies above the carbon K edge (284 eV) are highly absorbed in the polycarbonate but photons with energies below the K edge are absorbed in the aluminum and produce photoelectrons. This yields a photoelectron sensitivity which is peaked at approximately 275 eV. The photoelectrons are accelerated by a 10 kV cathode potential to an aluminum anode coating on the scintillator and scintillation photons are observed with an image converter camera. Streak photographs of exploded-wire XUV radiation taken with this system are presented.

AD-A013 638/2GA PC$3.75/MF$2.25
Naval Research Lab Washington D C
Accelerators for the Fusion Program.
Interim rept.,
R. N. Sudan. Jul 75, 27p Rept no. NRL-MR-3073

Descriptors: *Plasmas(Physics), *Particle accelerators, *Nuclear fusion, Electron beams, Ion beams, Heating.
Identifiers: Tokamaks.

The role of accelerated particle beams in the controlled fusion program is reviewed. A brief discussion of neutral beam heating of Tokamak plasma is followed by an account of the physical processes underlying the anomalous stopping length of high power electron beams in plasmas of different density regimes. Applications of such E-beam heating to pulsed fusion systems is noted. Finally the recent success of high-power ion accelerators leads to serious consideration of their use in generating field reversed proton-layers. The magnetic compression of P-layers to reach energy and power density required for Lawson breakeven condition is examined.

AD-A013 693/7GA PC$3.25/MF$2.25
Aerospace Corp El Segundo Calif Space Physics Lab
Resonance Broadening in a Turbulent Plasma.
Interim rept.,
Michael Schulz. 14 Jul 75, 15p Rept no. TR-0076(6260-20)-5 SAMSO-TR-75-185
Contract F04701-75-C-0076
Space and Missile Systems Organization, Los Angeles, Calif.

Descriptors: *Resonance absorption, *Plasma medium, Spectral lines, Numerical analysis, Turbulence.
Identifiers: *Line width.

Resonance between a wave and a particle in a uniform plasma can be defined by a general formula. In a turbulent plasma, however, this resonance defined is further broadened by virtue of particle diffusion in phase space. The purpose of the present note is to describe an intuitive classroom-level derivation, by means of which one could have estimated the width of the resonance without invoking a formal derivation. The intuitive approach makes instructive use of (a) the classical uncertainty principle and (b) the random-walk interpretation of diffusion, in placing convergent lower and uper bounds on the time interval during which a wave and a particle can interact coherently. The optimal interaction time thus obtained corresponds to the minimum bandwidth that can be assigned to the resonance.

AD-A013 840/4GA PC$3.25/MF$2.25
Rensselaer Polytechnic Inst Troy N Y Plasma Dynamics Lab
Current Density and Space Potential in Plasmas.
Interim rept.,
Robert L. Hickok, and William C. Jennings. Jun 75, 12p Rept no. RPDL-75-6 AFOSR-TR-75-1166
Grant AF-AFOSR-2638-74

Descriptors: *Plasmas(Physics), *Electric arcs, *Magnetic pinch, Ion beams, Electrostatic probes.

A model that describes the operation of a magnetically confined, hollow cathode arc discharge has been developed. This model will be used to design a high current arc facility suitable for the development of plasma current density techniques using an ion beam probe. Improved electrostatic energy analyzers for use with ion beam probing have been developed. The new analyzers provide better frequency response and permit the evaluation of the position and velocity displacement produced by the plasma current.

AD-A013 936/0GA PC$3.75/MF$2.25
Colorado State Univ Fort Collins Dept of Electrical Engineering
Non-Equilibrium in a Free-Burning Argon Arc Plasma.
M. Nilmura, P. W. Chan, and R. J. Churchill. Dec 74, 50p Rept no. Scientific-12 AFCRL-TR-74-0638
Contract F19628-70-C-0035

Descriptors: *Plasmas(Physics), *Electric arcs, Thermoelectricity, Equilibrium(General), Electron density, Ion density, Argon, Electron energy, Computer programs.
Identifiers: *Argon plasma, Thomson scattering, Plasma diagnostics, Themis project.

The axial distributions of the electron temperature and number density in a free-burning argon arc plasma at atmospheric pressure have been measured experimentally using a Thomson scattering technique. The axial temperature distribution has also been measured spectroscopically by the relative line intensity method. The results are presented in terms of the degree of non-equilibrium distribution shifted from the calculated Saha equilibrium temperature and the heavy particle temperature at different spatial positions along the axis of the arc. It is shown that the temperatures as measured by light scattering are different from those measured by relative line intensity ratio method. The difference is ascribed to the nonequilibrium of the arc as well as to the special geometry of the arc cathode.

AD-A013 938/6GA PC$4.25/MF$2.25
Colorado State Univ Fort Collins Dept of Electrical Engineering
Electrostatic Diagnostics of High-Pressure Plasma.
Robert C. Hazelton, R. J. Churchill, and P. W. Chan. Dec 74, 58p Rept no. Scientific-13 AFCRL-TR-74-0639
Contract F19628-70-C-0035

Descriptors: *Plasmas(Physics), *Electrostatic probes, Blackout(Propagation), Atmosphere entry, Electron energy, Electron density, Ion density, Continuum mechanics, Argon.
Identifiers: Plasma diagnostics, Argon plasma, Themis project.

Considerable interest has been generated in the measurements of reentry plasma parameters because of the communication blackout produced by the plasma surrounding a reentry vehicle. An electrostatic probe is well suited for such diagnostics because of its simplicity, ruggedness, spatial resolution, and ease of in-

terpretation of measurements. The present work is concerned with a plane electrostatic probe diagnosis of a flowing, argon jet plasma with an electron temperature ranging from about 6000 - 8000K and an electron density in the range (10 to the 13th power - 10 to the 15th power/cc). The present work also deals with the analysis of two possible theories to describe the operation of the probe: a free fall theory and a continuum theory. Analysis of the experimental results indicates that the continuum theory for a plane electrostatic probe as developed by Su and Kiel (1966) is valid in the plasma tested.

AD-A013 990/7GA PC$3.25/MF$2.25
Naval Research Lab Washington D C
Numerical Study of the Dissipative Trapped-Electron Instability in Tokamaks.
Memorandum rept.,
K. R. Chu, and Wallace M. Manheimer. Jul 75.
12p Rept no. NRL-MR-3080

Descriptors: *Plasma devices, *Magnetic pinch, Instability, Electron density, Ion density, Dispersion relations.
Identifiers: Tokamaks, Plasma instabilities.

The dispersion relation for the dissipative trapped-electron mode including the effects of magnetic shear, finite ion Larmor radius, banana-plateau velocity space separation, ion temperature gradient, and ion-ion collisions is employed to examine the stability property of recent tokamak experiments. Instabilities, when they exist at all, mostly occur at k(rho sub i) about = 1, where (rho sub i) is the thermal ion Larmor radius. The often used anomalous heat conduction coefficient gamma/(k sup 2), predicts losses negligible compared to those observed experimentally.

CONF-720961-11 PC$4.00/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Plasma Heating by Adiabatic Compression.
R. A. Ellis, Jr. 1972, 7p
Contract AT(11-1)-3073

Descriptors: (*Plasma heating, *Adiabatic compression heating), (*Atc devices, Adiabatic compression heating), Magnetohydrodynamics, Plasma macroinstabilities, Scaling laws.

For abstract, see NSA 32 03, number 06115.

CONF-720961-12 PC$4.00/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Ion Cyclotron Heating Experiments on the St Tokamak.
W. Hooke. 4p

Descriptors: (*St tokamak, *Icr heating), (*Plasma heating, Icr heating), Energy spectra, Ion temperature, Magnet coils, Magnetic fields.

For abstract, see NSA 32 03, number 06116.

CONF-720961-13 PC$4.00/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Non-Linear Effects and Plasma Heating Near the Lower Hybrid Resonance Frequency.
W. Hooke. 1972, 3p
Contract AT(11-1)-3073

Descriptors: (*Plasma heating, *High-frequency heating), Hybrid resonance, Nonlinear problems, Plasma density, Plasma waves.

For abstract, see NSA 32 03, number 06117.

CONF-720961-14 PC$4.00/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Parametric Instabilities and Anomalous Absorption and Heating of Plasmas.
M. Porkolab. 1972, 8p

Descriptors: (*Plasma instability, *Parametric instabilities), (*Plasma heating, *High-frequency heating), Absorption, Bernstein mode, Boltzmann-vlasov equation, Electron plasma waves.

For abstract, see NSA 32 03, number 06167.

CONF-720961-15 PC$4.00/MF$2.25
Princeton Univ., N.J.
Nonlinear Theory for the Parametric Instability with Comparable Electron and Ion Temperatures.
C. Oberman. 1972, 9p

Descriptors: (*Plasma instability, *Nonlinear problems), Electron temperature, Ion temperature, Landau damping, Parametric instabilities.

For abstract, see NSA 32 03, number 06168.

CONF-750339-1 PC$4.00/MF$2.25
Tennessee Univ., Knoxville.
State Variable Model of a Tokamak Thermonuclear Device.
J. M. Bailey, and R. V. Miskell. 1972, 7p

Descriptors: (*Tokamak devices, *Mathematical models), Eddy currents, Equilibrium plasma, Magnetic fields, Mockup.

For abstract, see NSA 32 03, number 06152.

CONF-750606-1 PC$4.00/MF$2.25
Oak Ridge National Lab., Tenn.
Collisional Functional Representation.
H. K. Meier, W. I. van Rij, and C. O. Beasley, Jr. 1973, 5p

Descriptors: (*Plasma drift, *Computer calculations), Boltzmann-vlasov equation, Kinetic equations, Magnetohydrodynamics, Toroidal configuration.

For abstract, see NSA 32 03, number 06153.

COO-2059-43 PC$6.00/MF$2.25
Iowa Univ., Iowa City Dept. of Physics and Astronomy.
Two-Dimensional Turbulence in Inviscid Fluids or Guiding Center Plasmas.
C. E. Seyler, Jr, Y. Salu, D. Montgomery, and G. Knorr. Jan 75, 58p

Descriptors: (*Plasma, *Turbulence), Fourier analysis, Guiding-center approximation, Navier-stokes equation, Two-dimensional calculations.

For abstract, see NSA 32 03, number 06154.

COO-2081-22 PC$4.00/MF$2.25
Colorado Univ., Boulder.
Nonlinear Effects in Mirror Machines.
R. E. Aamodt. Mar 75, 12p
Contract E(11-1)-2081

Descriptors: (*Magnetic mirrors, *Nonlinear problems), Energy losses, Plasma microinstabilities, Reviews.

For abstract, see NSA 32 03, number 06169.

COO-2229-7 PC$4.00/MF$2.25
Rensselaer Polytechnic Inst., Troy, N.Y. Plasma Dynamics Lab.
Density-Space Potential Phase Difference in a Kelvin--Helmholtz Instability.
J. C. Glowienka, W. C. Jennings, and R. L. Hickok. 1974, 8p CONF-741079-8
Contract AT(11-1)-2229

Descriptors: (*Electric discharges, *Plasma instability), (*Plasma macroinstabilities, *Helmholtz instability), (*Plasma microinstabilities, *Drift instability), Hollow cathodes, Mathematical models.

For abstract, see NSA 32 03, number 06170.

COO-2229-8 PC$4.00/MF$2.25
Rensselaer Polytechnic Inst., Troy, N.Y. Plasma Dynamics Lab.
Advances in Electrostatic Energy Analyzers for Ion Beam Probe Diagnostic Systems.
L. A. Bird, J. C. Glowienka, W. C. Jennings, and R. L. Hickok. 1974, 6p CONF-741079-7
Contract AT(11-1)-2229

Descriptors: (*Plasma diagnostics, Electrostatic analyzers), (*Electrostatic analyzers, *Performance), Electric currents, Ion beams, Stability.

For abstract, see NSA 32 03, number 06127.

COO-2456-3 PC$4.00/MF$2.25
Columbia Univ., New York Plasma Research Lab.
Strong Shock Wave Heating to Fusion Temperatures in Strong Magnetic Fields.
R. T. Taussig. 1975, 4p CONF-750218-1

Descriptors: (*Plasma heating, *Shock heating), Belt pinch, Magnetic fields, Magnetohydrodynamics, One-dimensional calculations.

For abstract, see NSA 32 03, number 06118.

IPP-III-15 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Method to Measure Very High DC Currents with Active Integrators.
J. Gernhardt, and D. Groening. Dec 74, 13p
In German. U.S. Sales Only.

Descriptors: (*Plasma diagnostics, *Magnetic probes), Direct current, Electronic circuits, Magnetic fields, Measuring methods.

For abstract, see NSA 32 03, number 06129.

IPP-IV-80 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Absorption and Scattering of Neutral Particle BEAMS Used for the Determination of Plasma Parameters.
H. M. Mayer. Feb 75, 16p
U.S. Sales Only.

Descriptors: (*Plasma diagnostics, *Atomic beams), Helium, Hydrogen, Neon, Neutral atom beam injection, Scattering.

For abstract, see NSA 32 03, number 06130.

IPP-S/131 PC$4.00/MF$2.25
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
Energy Principle for 2-D Resistive Instabilities.
H. Tasso. Mar 75, 10p
U.S. Sales Only.

Descriptors: (*Plasma instability, *Two-dimensional calculations), Configuration, Electric currents, Equations, Stability.

For abstract, see NSA 32 03, number 06172.

ITP-74-116P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Kinetic Effects in a Half-Space Plasma.
V. I. Zasenko, and V. N. Pavlenko. 1974, 8p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma waves, *Reflection), Boundary layers, Kinetic equations, Oscillations.

For abstract, see NSA 32 03, number 06223.

ITP-74-117P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Echo in the Half-Space Plasma.
A. G. Sitenko, V. N. Pavlenko, and V. I. Zasenko. 1974, 8p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma waves, *Reflection), Boundary layers, Electric fields, Electrons, Oscillations.

For abstract, see NSA 32 03, number 06224.

KHFTI-74-43 PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kharkov. Fiziko-Tekhnicheskij Inst.
Measuring Device for Power Absorbed by Plasma During RF Heating.
S. S. Kalinichenko. 1974, 12p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma heating, *High-frequency heating), Amplifiers, Measuring methods, Reflection.

For abstract, see NSA 32 03, number 06120.

KHFTI-74-44 PC$4.75/MF$2.25
AN Ukrainskoj SSR, Kharkov. Fiziko-Tekhnicheskij Inst.
Power and Signal-Information Circuits for HF Plasma Heating.
S. S. Kalinichenko, P. I. Kurilko, and O. M. Shvets. 1974, 33p
In Russian. U.S. Sales Only.

Descriptors: (*Plasma heating, *High-frequency heating), Electronic circuits, Electronic equipment, Measuring methods.

For abstract, see NSA 32 03, number 06121.

LA-UR-74-1956 PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Methods to Reduce the Effects of Self Lasing and Target Reflections in CO sub 2 Lasers.
W. H. Reichelt, C. E. Landahl, E. E. Stark, and T. F. Stratton. 1974, 6p CONF-750520-3
Contract W-7405-ENG-36

Descriptors: (*Carbon dioxide lasers, *Operation), (*Laser implosions, *Reflection), Efficiency, Laser-produced plasma, Targets.

For abstract, see NSA 32 03, number 06161.

LA-5703-SR(Rev.) PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Laser Fusion Target Fabrication. Status Report, 30 April 1974.
R. J. Fries, and E. H. Farnum. Nov 74, 23p
Contract W-7405-eng-36

Descriptors: (*Thermonuclear fuels, *Fabrication), (*Microspheres, Fabrication), Interactions, Laser implosions, Laser radiation, Targets.

For abstract, see NSA 32 03, number 06160.

LA-5895-MS PC$4.00/MF$2.25
Los Alamos Scientific Lab., N.Mex.
Ion Temperature Measurement by Laser Scattering at 2.8 mu .
A. W. DeSilva. Feb 75, 9p
Contract W-7405-ENG-36

Descriptors: (*Plasma diagnostics, *Laser radiation), (*Scyllac devices, Plasma diagnostics), Ion temperature, Scattering.

For abstract, see NSA 32 03, number 06141.

MATT-1(Supp.4) PC$4.00/MF$2.25
Princeton Univ., N.J. Dept. of Physics.
Bibliography of Plasma Physics Laboratory Reports and Publications Covering the Period January 1--December 31, 1974.
May 75, 15p
Contract AT(11-1)-3073

Descriptors: (*Plasma, *Bibliographies).

No abstract available.

MATT-1119 PC$4.75/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Coupling to Fast Mhd Eigenmodes in a Toroidal Cavity.
F. J. Paoloni. May 75, 31p
Contract AT(11-1)-3073

Descriptors: (*Plasma waves, *Coupling), (*Plasma macroinstabilities, Coupling), Eigenfrequency, Magnetohydrodynamics, Toroidal configuration, Transit-time magnetic pumping.

For abstract, see NSA 32 03, number 06173.

MATT-1128 PC$4.75/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Ohmic Heating of Tokamaks.
J. C. Hosea. Apr 75, 31p CONF-740969-3
Contract AT(11-1)-3073

Descriptors: (*Tokamak devices, *Joule heating), (*Plasma heating, Joule heating), Beam currents, Performance, Plasma confinement.

For abstract, see NSA 32 03, number 06123.

MATT-1130 PC$4.25/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Thresholds of Parametric Instabilities Near the Lower Hybrid Frequency.
R. L. Berger, and F. W. Perkins. Jun 75, 22p
Contract AT(11-1)-3073

Descriptors: (*Plasma instability, *Parametric instabilities), Bernstein mode, Cyclotron frequency, Homogeneous plasma, Hybrid resonance.

For abstract, see NSA 32 03, number 06174.

MATT-1132 PC$5.25/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Confinement of Energetic Alphas in Tct and Tritons in Plt.
F. H. Tenney. May 75, 43p
Contract AT(11-1)-3073

Descriptors: (*Tokamak devices, Alpha particles), (*Alpha particles, *Confinement), Ion drift, Orbits, Toroidal configuration, Tritons.

For abstract, see NSA 32 03, number 06124.

MATT-994 PC$4.00/MF$2.25
Princeton Univ., N.J. Plasma Physics Lab.
Tokamak Heating by Neutral BEAMS and Adiabatic Compression.
H. P. Furth. Aug 73, 15p CONF-730705-28
Contract AT(11-1)-3073

Descriptors: (*Tokamak devices, Plasma heating), (*Plasma heating, *Adiabatic compression heating), Deuterium, Neutral atom beam injection, Tritium.

For abstract, see NSA 32 03, number 06122.

N75-25990/3GA PC$3.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Theoretical Investigations on the Coaxial Accelerator with Compression Coil Theoretische Untersuchungen ueber den Koaxialen Beschleuniger MIT Kompressionsspule.
H. Kuczera. Mar 74, 18p TUM-LRT-TB-18
Conf-Presented at the Meeting of the Dglr Comm. Magnetofluiddyn., Stuttgart, 20-21 Feb. 1974.
Language in German.

Descriptors: *Coaxial plasma accelerators, *Compressing, *Field coils, *Micrometeoroids, Current distribution, Equivalent circuits, Glass, Magnetic fields, Spheres.

For abstract, STAR 1317

N75-26337/6GA PC$3.75/MF$2.25
Texas Univ., Dallas.
Laboratory Plasma Probe Studies.
Semiannual Status Report, 1 Aug. 1974 - 31 Jan. 1975.
W. J. Heikkila. 31 Jan 75, 37p NASA-CR-143032
Contract NGR-44-004-030

Descriptors: *Collisionless plasmas, *Plasma diagnostics, *Plasma probes, Carbon dioxide, Electrical impedance, Electroacoustic waves, Electrostatic probes, Plasma electrodes, Plasma frequencies, Plasma resonance, Plasma waves.

For abstract, STAR 1317

N75-26860/7GA PC$3.75/MF$2.25
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Observation of Drift Motion of a Collisional Plasma in Cross Fields.
A. Hussain. Apr 75, 27p IPPJ-221

Descriptors: *Crossed fields, *Particle motion, *Plasma control, Drift rate, Electrostatic probes, Larmor precession, Scattering cross sections.

For abstract, STAR 1317

N75-26861/5GA PC$3.25/MF$2.25
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Ion Drift Velocity Measurement in a Collisional Plasma.
A. Hussain, T. Kuroda, and G. Horikoshi. Mar 75, 15p IPPJ-216

Descriptors: *Collisional plasmas, *Drift rate, *Ion motion, *Velocity measurement, Electric fields, Electrostatic probes, Magnetic fields, Numerical analysis.

For abstract, STAR 1317

N75-26862/3GA PC$3.25/MF$2.25
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Two Stream Instability of Quasiparticles.
A. Hasegawa. Apr 75, 5p IPPJ-217

Descriptors: *Elementary excitations, *Flow stability, Kinetic equations, Monochromatic radiation, Nonlinearity, Schroedinger equation.

For abstract, STAR 1317

N75-26863/1GA PC$3.25/MF$2.25
Nagoya Univ. (Japan). Inst. of Plasma Physics.

Rotational Motion of a Collisional Plasma Cylinder in Radial Electric and Axial Magnetic Fields.
G. Horikoshi, A. Hussain, and T. Kuroda. Apr 75, 17p IPPJ-218

Descriptors: *Collisional plasmas, *Electric fields, *Magnetic fields, *Plasma cylinders, *Rotating cylinders, Boltzmann distribution, Friction factor, Numerical analysis, Radial distribution.

For abstract, STAR 1317

N75-26864/9GA PC$3.25/MF$2.25
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Theory of Envelope Shock.
K. Mima, K. Nishikawa, and H. Ikezi. May 75, 12p IPPJ-222

Descriptors: *Electron plasma, *Plasma waves, *Shock wave interaction, Electron density (Concentration), Ion acoustic waves, Plasma density, Plasma resonance.

For abstract, STAR 1317

N75-26865/6GA PC$3.25/MF$2.25
Nagoya Univ. (Japan). Inst. of Plasma Physics.
Self-Phase Modulation of Laser Light in Laser Produced Plasma.
C. Yamanaka, T. Yamanaka, J. Mizui, and N. Yamaguchi. Feb 75, 13p IPPJ-215

Descriptors: *Laser plasmas, *Light modulation, *Phase deviation, Deuterium plasma, Hydrogen plasma, Plasma density, Self focusing, Spectral line width.

For abstract, STAR 1317

N75-26866/4GA PC$4.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Calculation of the Magnetostatic Field of Coils and Determination of the Field Line Pattern Zur Berechnung des Stationaeren Magnetfeldes von Spulen und der Ermittlung des Feldlinienverlaufs.
H. Kuczera. Aug 73, 67p TUM-LRT-TB-4
Language in German.

Descriptors: *Conical bodies, *Field coils, *Lines of force, *Magnetostatic fields, *Plasma accelerators, Approximation, Computer programs, Current distribution, Field strength.

For abstract, STAR 1317

N75-26867/2GA PC$5.75/MF$2.25
Technische Univ., Berlin (West Germany). Inst. fuer Thermo- und Fluiddynamik.
On the Stability of Conducting Plane and Hollow Jets in a Parallel Magnetic Field.
Ph.D. Thesis.
P. Plaschko. 15 Nov 74, 128p DLR-FB-74-14
In German; English Summary.

Descriptors: *Free jets, *Magnetic field configurations, *Magnetohydrodynamic stability, *Plasma jets, Axisymmetric flow, Eigenvalues, Flow distribution, Linear equations.

For abstract, STAR 1317

RISO-M-1790 PC$4.00/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
Ion Acoustic Waves in the Presence of High Frequency Oscillations.
H. L. Pecseli. Feb 75, 20p
U.S. Sales Only.

Descriptors: (*Ion acoustic waves, *Wave propagation), (*Plasma waves, Wave propagation), Distribution functions, Electron drift, Ions, Oscillations.

For abstract, see NSA 32 03, number 06225.

RISO-321 PC$4.00/MF$2.25
Danish Atomic Energy Commission, Risoe. Research Establishment.
Effect of Boundary Layer on the Separation Distance Magnetically Driven Shock Tube.
C. T. Chang. Feb 75, 12p
U.S. Sales Only.

Descriptors: (*Shock tubes, *Boundary layers), Magnetic fields, Plasma, Plasma sheath, Shock waves.

For abstract, see NSA 32 03, number 06146.

SAND-75-5231 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Coupled Electron/Photon Transport in Static External Magnetic Fields.
J. A. Halbleib, Sr, and W. H. Vandevender. 8p
CONF-750703-6

Descriptors: (*Plasma, *Transport theory), Electrons, Magnetic fields, Mathematical models, Photons.

For abstract, see NSA 32 03, number 06156.

SAND-75-5417 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Electron Beam Fusion Targets.
M. J. Clauser, and M. A. Sweeney. 1975, 17p
CONF-750531-1

Descriptors: (*Thermonuclear fuels, *Compression), (*Plasma production, *Electron beams), Gold, Shells, Targets.

For abstract, see NSA 32 03, number 06162.

SAND-75-5441 PC$4.00/MF$2.25
Sandia Labs., Albuquerque, N.Mex.
Two-Dimensional Ion Effects in Relativistic Diodes.
J. W. Poukey. 1975, 15p CONF-750539-1

Descriptors: (*Electron sources, *Two-dimensional calculations), (*Plasma production, *Electron beams), Ion sources, Irradiation.

For abstract, see NSA 32 03, number 06163.

SU-IPR-497 PC$5.50/MF$2.25
Stanford Univ., Calif. Inst. for Plasma Research.
Virtual Memory Utilization in Large Plasma Simulation Codes.
C. Barnes. Nov 72, 48p
Contract AT(04-3)-799

Descriptors: (*Plasma simulation, *Computer calculations), Fourier transformation, Plasma, Three-dimensional calculations, Two-dimensional calculations.

For abstract, see NSA 32 03, number 06157.

TID-26817 PC$4.50/MF$2.25
Colorado Univ., Boulder.
Radiation Coupling of Bernstein Modes in Dense Loss-Cone Like Plasmas. Progress Report.
J. Hoffman. Jul 74, 30p
Contract AT(11-1)-2081

Descriptors: (*Plasma instability, *Bernstein mode), Coupling, Instability growth rates, Plasma, Polarization, Stability.

For abstract, see NSA 32 03, number 06175.

UCCND-CSD-INF-21 PC$8.00/MF$2.25
Oak Ridge National Lab., Tenn.
Preliminary Description of the Linear and Nonlinear Ideal Mhd Codes.
J. W. Wooten, and H. R. Hicks. May 75, 96p
Contract W-7405-eng-26

Descriptors: (*Tokamak devices, Plasma macroinstabilities), (*Plasma macroinstabilities, *Computer calculations), Instability growth rates, Magnetohydrodynamics, Nonlinear problems.

For abstract, see NSA 32 03, number 06176.

UCID-16775 PC$4.50/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
X-Ray Calibration of Kodak No-Screen, Type AA, and Type M in the 1-4.5 Kev Region.
J. P. Stoering, and A. Toor. 8 May 75, 30p
Contract W-7405-Eng-48

Descriptors: (*Plasma diagnostics, *X-ray spectroscopy), (*Photographic films, *Calibration), X radiation, X-ray spectra.

For abstract, see NSA 32 03, number 06143.

UCLA-34P157X8 PC$9.25/MF$2.25
California Univ., Los Angeles.
Joint Experimental--Theoretical Program in Plasma Physics of Controlled Fusion for the Period January 1, 1975--December 31, 1975.
B. D. Fried, J. M. Dawson, A. Y. Weng, and F. F. Chen. 1975, 123p
Contract AT(11-1)-34

Descriptors: (*Laser implosions, *Research programs), (*Plasma simulation, Research programs), (*Plasma heating, Research programs), Computer calculations, Plasma.

For abstract, see NSA 32 03, number 06147.

UCRL-76612 PC$4.00/MF$2.25
California Univ., Livermore Lawrence Livermore Lab.
Limitation of Brillouin Scatter in Plasmas.
W. L. Kruer, E. J. Valeo, and K. G. Estabrook. 18 Apr 75, 18p CONF-750437-1

Descriptors: (*Plasma, *Brillouin effect), Mathematical models, Reflection, Scattering.

For abstract, see NSA 32 03, number 06226.

20J. Quantum Theory

AD-A013 680/4GA PC$3.25/MF$2.25
California Univ Irvine Dept of Physics
Theory of Rayleigh Wave Scattering by Mass Defects and Surface Roughness.
Interim rept.,
A. A. Maradudin, D. L. Mills, and R. F. Wallis. 8 Aug 75, 4p Rept no. 75-29
Contract N00014-69-A-0200-9003, Grant AF-AFOSR-2887-76

Descriptors: *Rayleigh waves, *Rayleigh scattering, Green's function, Wave propagation, Equations of motion, Isotropism, Phonons, Scattering, Planar structures, Surface proper-

ties, Surface roughness, Crystal defects, Modulus of elasticity, Attenuation, Scattering cross sections.
Identifiers: Poynting vector, Born approximation.

A Green's function method has been used to obtain an expression for the mean free path of a Rayleigh wave propagating along a planar free surface of an isotropic elastic continuum and scattered by a mass defect or a patch of surface roughness.

AD-A013 743/0GA PC$3.25/MF$2.25
Wisconsin Univ Madison Dept of Chemistry
Synchrotron Radiation as a Light Source,
James W. Taylor. 1974, 16p AFOSR-TR-75-1178
Grants AF-AFOSR-1725-69, NSF-GP-36236X
Availability: Pub. in Chemical Spectroscopy and Photochemistry in the Vacuum-Ultraviolet, p543-557 1974.

Descriptors: *Continuum mechanics, Synchrotrons, Vacuum ultraviolet radiation, Polarization, High intensity, Global, Reprints.

This is a chapter in a book dealing with the theoretical basis for the intensities and wavelengths of synchrotron radiation sources in the world, its practical use for studies in chemistry and physics, and the description of some experiments which utilize the properties of the continuum, high intensity, polarization and high vacuum. (Author)

AD-A013 759/6GA PC$3.25/MF$2.25
Yeshiva Univ New York Dept of Physics
On the Stability of Equilibrium States of Finite Classical Systems,
Joel L. Lebowitz, Michael Aizemann, and Sheldon Goldstein. 2 Jan 75, 6p AFOSR-TR-75-1195
Grant AF-AFOSR-2430-73
Availability: Pub. in Jnl. of Mathematical Physics, v16 n6 p1284-1287 Jun 75.

Descriptors: *Statistical mechanics, *Measure theory, *Probability, *Hamiltonian, *Quantum theory, Stability, Equilibrium(General), Particles, Thermodynamics, Reprints.
Identifiers: Liouville equation, Lebesque measure, Gibbs ensembles, *Equilibrium states, *Classical systems, Non-ergodic systems, *Ensemble density.

COO-1545-149 PC$4.25/MF$2.25
Ohio State Univ., Columbus Dept. of Physics.
Quantization of Fields Obeying Nonlinear Constraints: The Minimally Interacting Spin-3/2 Field.
G. B. Mainland. 1974, 25p
Contract E(11-1)-1545

Descriptors: Commutators, Coulomb field, Coupling constants, Electromagnetic fields, Fermions, Gauge invariance, Interactions, Mass, Poincare groups, Quantum field theory, Rarita-schwinger theory, Spin.

For abstract, see NSA 32 03, number 07931.

COO-3071-139 PC$5.25/MF$2.25
Pennsylvania Univ., Philadelphia Dept. of Physics.
Matrix Mechanics as a Practical Tool in Quantum Theory: The Anharmonic Oscillator.
C. T. Li, A. Klein, and F. Krejs. 18 Mar 75, 41p

Descriptors: (*Quantum mechanics, *Matrices), Algebra, Eigenfunctions, Equations of motion, Functions, Hilbert space, Matrix elements, Mechanics, Nonlinear problems, Polynomials, Quantum numbers, Sum rules, Variational methods, Wave functions.

For abstract, see NSA 32 03, number 07905.

ITF-74-149P PC$5.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Separation of Reference System in a Collective Variable Method.
I. R. Yukhnovskii. 1974, 36p
In Russian. U.S. Sales Only.

Descriptors: (*Coordinates, *Virial equation), Correlation functions, Coulomb scattering, Distribution functions, Group theory, Integrals, Interaction range, Renormalization, Series expansion.

No abstract available.

ITF-75-7P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Ground State of Many Boson Model Systems. I. One-Dimensional Bose-Gas with delta-Repulsion Interaction.
I. A. Vakarchuk. 1975, 15p
In Russian. U.S. Sales Only.

Descriptors: (*Many-body problem, *Ground states), Bosons, Coupling, Distribution functions, Gases, One-dimensional calculations, Particle models, Potential energy.

No abstract available.

ITP-74-115E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
S-Operator Representability in the Strong Normal Form.
Yu. M. Lomsadze, E. P. Sabad, and B. A. Agranovskii. 1974, 15p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *Scalar fields), Mathematical operators, Mathematical space, Spectra, Time dependence, Vectors.

For abstract, see NSA 32 03, number 07942.

ITP-74-120P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Limiting Problem for the Three Particle System.
G. F. Filippov, and V. S. Vasilevskii. 1974, 19p
In Russian. U.S. Sales Only.

Descriptors: (*Schroedinger equation, *Three-body problem), Adiabatic approximation, Boundary conditions, Energy, Exchange interactions, Fermions, Oscillators, Quantum numbers, Rotation, Symmetry, Two-body problem, Wave functions.

For abstract, see NSA 32 03, number 07909.

ITP-74-122E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Cauchy Problem for the Kinetic Bogoliubov Equations. The BCS Model.
O. K. Vidybida. 1974, 20p
U.S. Sales Only.

Descriptors: (*Bcs theory, *Cauchy problem), Distribution, Integrals, Kinetics, Mathematical operators, Mathematical space.

For abstract, see NSA 32 03, number 07910.

ITP-74-153P PC$4.75/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Non-Gaussian Homogeneous Random Fields and Their Application in Quantum Field Theory. I.
N. S. Gonchar, and R. S. Matskiv. 1974, 32p
In Russian. U.S. Sales Only.

Descriptors: (*Quantum field theory, *Volume), Analytic functions, Field theories, Gauss function.

For abstract, see NSA 32 03, number 07943.

ITP-74-41E PC$4.75/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Equations for Coefficient Functions of S-Matrix in G(:Phi exp 4 :) sub 2 Theory at Infinite Volume.
A. L. Rebenko. 1974, 31p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *S matrix), Hilbert space, Volume.

For abstract, see NSA 32 03, number 07940.

ITP-74-76E PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Uniqueness of the Dynamics of Cut-off Models in Quantum Field Theory.
Ya. M. Yakymiv. 1974, 12p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *Kinetics), Annihilation operators, Creation operators, Hamiltonians, Interactions, Kernels, Mathematical space, Symmetry, Wick theorem.

For abstract, see NSA 32 03, number 07941.

JINR-E2-8587 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Causality in Quantum Electrodynamics.
M. I. Shirokov. 1975, 24p
U.S. Sales Only.

Descriptors: (*Quantum electrodynamics, *Causality), Electrons, Mathematical operators, Quantum mechanics, Signals, Velocity, Wave propagation.

For abstract, see NSA 32 03, number 07944.

JINR-E2-8593 PC$4.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Inverse Higgs Phenomenon in Nonlinear Realizations.
E. A. Ivanov, and V. I. Ogievetskii. 1975, 28p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *Gauge invariance), (*Yang-mills theory, Gauge invariance), Chirality, Conformal invariance, Kinetics, Nonlinear problems, Space-time, Symmetry, Symmetry breaking.

For abstract, see NSA 32 03, number 07945.

JINR-E2-8646 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Canonical Realizations of the Lie Algebras Gl(N,R) and Sl(N,R). I. Formulae and Classification.
M. Havlicek, and W. Lassner. 1975, 17p
U.S. Sales Only.

Descriptors: Algebra, Casimir operators, Group theory, Hermitian matrix, Lie groups, Polynomials, Quantum mechanics, Sl groups.

For abstract, see NSA 32 03, number 07911.

JINR-E2-8681 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Projection Operators and Supplementary Conditions for Superfields with an Arbitrary Spin.
E. S. Sokatchev. 1975, 21p
U.S. Sales Only.

Descriptors: (*Quantum field theory, *Projection operators), Algebra, Casimir operators, Irreducible representations, Mass, Multiplets, Spin, Symmetry.

For abstract, see NSA 32 03, number 07946.

JINR-P2-8689 PC$5.50/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Numerical Methods for Solving a Class of Singular Boundary Value Problems in Quantum Mechanics and Field Theory.
D. P. Mavlo, I. V. Puzynin, and A. T. Filippov.
1975, 48p
In Russian. U.S. Sales Only.

Descriptors: (*Quantum mechanics, *Boundary conditions), (*Field theories, Boundary conditions), (*Hadrons, *Composite models), Differential equations, Integral equations, Singularity.

For abstract, see NSA 32 03, number 07947.

JINR-P2-8749 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Asymptotical Properties of Kaellen--Lehmann Representation.
N. V. Krasnikov, and K. G. Chetyrkin. 1975, 21p
In Russian. U.S. Sales Only.

Descriptors: (*Scalar fields, *Spectral functions), Boundary conditions.

For abstract, see NSA 32 03, number 07948.

JINR-P4-8710 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR).
Two-Center Problem in Quantum Mechanics. VI. The Wave Functions of the Continuum.
L. I. Ponomarev, and L. N. Somov. 1975, 25p
In Russian. U.S. Sales Only.

Descriptors: (*Quantum mechanics, *Wave functions), Coulomb scattering, Linear momentum.

For abstract, see NSA 32 03, number 07912.

20K. Solid Mechanics

AD-A013 622/6GA PC$4.25/MF$2.25
Naval Postgraduate School Monterey Calif
Fundamental Vibrational Frequency by a 3D - FEM Procedure.
Master's thesis,
Howard Lawrence Crego. Jun 75, 68p

Descriptors: *Vibration, *Computer programs, *Finite element analysis, Elastic properties, Structural members, Computations, Theses, FORTRAN.
Identifiers: *NAT1-3D computer program.

This thesis presents a computer program which will solve for the lowest natural vibrational frequency of an arbitrarily shaped three dimensional object. The program was developed using a finite element numerical model which may employ either linear or quadratic isoparametric elements. Necessary instructions and guides for the user are included.

AD-A013 753/9GA PC$3.75/MF$2.25
Naval Academy Annapolis Md
Large Strains,
V. J. Lopardo. 1975, 26p
Availability: Pub. in Progress in Experimental Mechanics, Durelli Anniversary Volume, p227-252 May 75.

Descriptors: *Strain(Mechanics), *Mechanics, *Stress strain relations, *Tensor analysis, *Lagrangian functions, Materials, Experimental data, Methodology, Solids, Photoelasticity, Displacement, Synthetic materials, Plastics, Rubber, Poisson ratio, Deformation, Engineering, Grids, Integral equations, Loads(Forces), Polyurethane resins, Modulus of elasticity, Mathematical models, Transparencies, Metal plates, Displacement, Reprints.
Identifiers: Natural strain, Eulerian equations, Morie method, Natural stresses, Polyurethane rubber, Durelli method.

The definitions of strain and the experimental methods used by Dr. Durelli and his associates to obtain strain are presented. The normal assumptions of small strain theory are not valid in large strain problems and emphasis is placed on methods which provide the experimentalist with the higher order terms in the strain-displacement equations. The Lagrangian, Eulerian, and Natural descriptions of stress and strain are discussed. The use of grids, photoelasticity, and moire in a variety of large strain problems are described and the results obtained are presented. (Author)

AD-A013 898/2GA PC$3.25/MF$2.25
Yale Univ New Haven Conn Dept of Engineering and Applied Science
Kinetics and Mechanism of Oxide Formation and Desorption for High Temperature Tantalum in Dissociated Oxygen,
Daniel E. Rosner, Hee Chung, and Heng Feng. 4 Sep 73, 6p AFOSR-TR-75-1199
Grant AF-AFOSR-2487-73
Availability: Pub. in Metallurgical Transactions, v5 p2305-2308 Nov 74.

Descriptors: *Reaction kinetics, Oxygen, Dissociation, Desorption, Oxides, High temperature, Tantalum, Reprints.

Exposure of tantalum filaments between 2400 and 2800 K to non-equilibrium partially dissociated oxygen is shown to increase both the steady-state dissolved oxygen concentration and the rate of tantalum oxide desorption. Yet the same quadratic correlation between tantalum oxide loss and dissolved oxygen concentration as observed for diatomic oxygen exposure is found to be preserved under conditions of oxygen atom impingement. This experimental observation is used to demonstrate that Rideal-type (direct atom impact) reaction steps are not responsible for metal oxide formation and desorption in the O(g)/Ta(s) system. Rather, a Langmuir-Hinshelwood (adatom interaction) reaction mechanism, combined with atomic oxygen chemisorption probabilities approximately twice those of incident molecular oxygen, suffice to explain the Ta-oxidation kinetic data reported herein.

AD-A013 915/4GA PC$6.25/MF$2.25
Universal Technology Corp Dayton Ohio
Modal Analysis of Linear Non-Conservative Systems.
Technical rept. Jun 69-Aug 72,
Richard L. Adkins. May 75, 166p AFML-TR-75-2
Contracts F33615-71-C-1606, F33615-72-C-2113
Prepared in cooperation with Ohio State Univ. Research Foundation, Columbus, Contracts F33615-67-C-1559, and F33615-69-C-1001.

Descriptors: *Vibration, *Beams(Structural), Linear systems, Damping, Equations of motion, Integral equations, Differential equations, Matrices(Mathematics), Degrees of freedom, Deformation.

Modal methods for analyzing continuous, linear, nonconservative vibrating systems are developed and applied. Both viscous and hysteretic damping are considered and the damping distributions are arbitrary such that the normal modes of the corresponding undamped system will not uncouple the equations of motion of the nonconservative or damped system. Analytical and graphical results are presented for the special case of a pinned-pinned beam with a viscous or hysteretic damping unit at the center of the beam. These results show the uncoupled vibration modes, and the amplitude and phase variation along the beam for uniform harmonic forcing. The results of this investigation are contrasted to the modal methods for conservative systems and it is recommended that nonconservative systems be considered the general vibration problem.

AD-A014 023/6GA PC$3.25/MF$2.25
Rosenstiel School of Marine and Atmospheric Science Miami Fla
The High Pressure 'PVT' Properties of Deuterium Oxide,
Rana A. Fine, and Frank J. Millero. 30 Dec 74, 7p
Contract N00014-67-A-0201-0013, Grant NSF-GA-40532
Availability: Pub. in Jnl. of Chemical Physics, v63 n1 p89-95, 1 Jul 75.

Descriptors: *Deuterium compounds, Hydrogen, Isotopes, Equations of state, Computer applications, High pressure, Isotherms, Compression, Specific volume, Oxides, Water, Reprints.

The high pressure isothermal compressibilities of deuterium oxide from 5 to 100 C and 0 to 1000 bars applied or gauge pressure were determined from sound speed data. These compressibilities were used to derive an equation of state of the form V0P/(V0 - VP) = B + A1P + A2P2, where V0 and VP are the specific volumes at an applied pressure of zero and P; and B, A1, and A2 are polynomial functions of temperature. The compressibilities derived from this equation of state are consistent with those derived from the sound speed data to + or - 0.016x10 to minus 6 bar minus 1 over the entire pressure and temperature range (this is equivalent to appox. 0.2 m sec minus 1 in sound speed). The 1 atm sound-derived compressibilities agree on the average to + or - 0.06x10 to minus 6 bar minus 1 with the direct measurements of Millero and Lepple. The P-V-T data from the sound-derived equation are compared with the high pressure work of Bridgman, Kesselman, Juza et al., and Emmet and Millero. Good agreement (average deviation of + or - 28x10 to minus 6 cm cube g minus 1) was found with the recent specific volume measurements of Emmet and Millero. The P-V-T properties of D2O are compared to pure water. D2O and H2O are shown to follow similar trends. Contrary to previous reports, the D2O/H2O ratios of the specific volumes and specific heats are shown to be functions of both temperature and pressure. (Author)

N75-26412/7GA PC$4.75/MF$2.25
George Washington Univ., Washington, D.C. School of Engineering and Applied Sciences.
Large Amplitude Flexural Vibration of Thin Elastic Flat Plates and Shells.
K. A. V. Pandalia. 1972, 89p NASA-CR-112164
Contract NGR-09-010-053

Descriptors: *Bending vibration, *Thin plates, *Thin walled shells, Displacement, Elastic bending, Hookes law, Nonlinearity, Orthogonal functions, Partial differential equations.

For abstract, STAR 1317

N75-26420/0GA PC$7.00/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Flugzeugbau.
Stiffness Coefficients of Plates with Integral Stiffeners.
Ph.D. Thesis - Brunswick Univ.
K. Rohwer. 1975, 187p DLR-FB-75-07
In German; English Summary.

Descriptors: *Orthotropic plates, *Ribs (Supports), *Stiffness, Buckling, Computer programming, Flow charts, Numerical analysis, Stiffening.

For abstract, STAR 1317

PAT-APPL-581 514/GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Anti-Gravity Device.
Patent Application.
S. Palsingh. Filed 28 May 75, 14p NASA-CASE-MFS-22758-1
Subm-Sponsored by NASA.
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Antigravity, *Gravitation, Center of gravity, Education, *Patent applications, Spheres.

An educational toy useful in demonstrating fundamental concepts regarding the laws of gravity is described. The device comprises a sphere 10 of radius r resting on top of sphere 12 of radius R. The center of gravity of sphere 10 is displaced from its geometrical center by distance D. The dimensions are so related that D((R+r)/r) is greater than r. With the center of gravity of sphere 10 lying on a vertical line, the device is in equilibrium. When sphere 10 is rolled on the surface of sphere 12 it will return to its equilibrium position upon release. This creates an illusion that sphere 10 is defying the laws of gravity. In reality, due to the above noted relationship of D, R, and r, the center of gravity of sphere 10 rises from its equilibrium position as it rolls a short distance up or down the surface of sphere 12. (Author)

TRG-Report-2414(R) PC$4.25/MF$2.25
UKAEA Reactor Group, Risley.
Piece-Wise Continuous Finite Element for the Stress Analysis of Plates and Shells.
D. A. Jobson. Mar 75, 22p
U.S. Sales Only.

Descriptors: (*Plates, *Stress analysis), (*Shells, Stress analysis), Finite element method.

For abstract, see NSA 32 03, number 06240.

TRG-2382(R) PC$4.75/MF$2.25
UKAEA Reactor Group, Risley.
Conida: A Finite Element Program for the Stress Analysis of Axisymmetric Thin Shells.
P. W. Clarke. Dec 74, 31p
U.S. Sales Only.

Descriptors: (*Shells, *Stress analysis), (*Computer codes, *C codes), Axial symmetry, Computer calculations, Elasticity, Finite element method.

For abstract, see NSA 32 03, number 06239.

20L. Solid-State Physics

AD-A013 650/7GA PC$10.25/MF$2.25
Stanford Univ Calif Center for Materials Research
Materials Research at Stanford University.
Rept. no. 14 (Annual), 1 Jul 74-30 Jun 75,
Jul 75, 362p Rept no. CMR-75-12
See also report dated Aug 74, AD-785 446.

Descriptors: *Materials, *Scientific research, Composite materials, Metals, Photoelectric materials, Amorphous materials, Crystals, Solid state physics, Superconductors, Semiconductors, Cryogenics, Magnetic properties, Electrochemistry, Geology, Chemical reactions, Polymers, Biological material, Phase studies, Mechanical properties, Physical chemistry.

This report contains brief descriptions of the various individual research programs active during the period July 1974, through June 1975. The organization of such a large and varied compilation presents a serious problem. It was decided that the simplest and most straightforward way to encompass Stanford's broad activities in this area would be an alphabetical arrangement by principal investigator. In addition to brief abstracts relating to the various research programs, compilations are included of publications, doctoral dissertations, faculty and senior staff members, research associates, graduate students and degrees awarded. From this compilation, it can be seen that research on materials and related problems is being conducted within twelve different academic departments as well as in the Hansen Microwave Laboratory.

AD-A013 684/6GA PC$3.25/MF$2.25
Aerospace Research Labs Wright-Patterson AFB Ohio
Calculations of III-V Semiconductor Properties.
Final rept. 1 Jul 74-30 Jun 75,
Sang Boo Nam. Jun 75, 21p Rept no. ARL-75-0153

Descriptors: *Semiconductors, Superconductivity, Transport properties, Transition temperature, Gallium arsenides, Indium phosphides, Excitons, Energy levels, Magnetic fields, Surface properties, Computer applications.
Identifiers: G factors, *Superconducting semiconductors.

The authors have developed a phenomenological scheme which accounts well for the observations of the exciton energy spectra in GaAs in the intermediate magnetic field regime, that is, where the magnetic energy is of the order of the coulomb energy. They have formulated a new method for calculating the g-factors in solids and applied it to obtain the values of the g-factors in conducting electron states in InP and GaAs. The calculated values of 1.24 for InP and 0.485 for GaAs agree with the experimental values of 1.20 + or - 0.05 for InP and 0.45 + or - 0.05 for GaAs. The initial formulation for calculating the transport properties in semiconductors has been established and the initial computer coding to calculate the above has been done. A prediction of obtaining coherent radiations from superconducting multijunctions is made. It appears that the surface states reduce the superconducting transition temperature.

AD-A013 685/3GA PC$4.75/MF$2.25
Aerospace Research Labs Wright-Patterson AFB Ohio
A Quasi One-Dimensional Approach to Elastic-Plastic Problems of Solid Mechanics.
Interim rept. Jan-Dec 74,
Karl G. Guderley. Jun 75, 91p Rept no. ARL-75-0136

Descriptors: *Solids, *Stress strain relations, Plastic properties, Elastic properties, Partial differential equations, Integral equations, Numerical integration, Method of characteristics.
Identifiers: Hyperbolic differential equations.

A major part of this report is a compilation in rather elementary terms of facts from the theory of elastic, plastic, and elastic-plastic plane solid mechanics, as far as they are useful for a numerical approach. The discussion includes the basic concepts, the question of the continuity of stresses along the elastic-plastic boundary, minimum principles, the theory of characteristics for the stresses, the stress rates and the strain rates in the plastic region, and some facts from plane elasticity theory which allow one to formulate the purely elastic problem as a pair of integral equations in which the unknown functions depend only upon one independent variable, say, the arc length of the boundary of the elastic region. The solution of the differential equations in the plastic region can be found by means of the method of characteristics (provided that the partial differential equations in this region are hyperbolic). On this basis it is possible to devise an algorithm in which the elastic and the plastic region are properly matched.

AD-A013 760/4GA PC$3.25/MF$2.25
Florida Atlantic Univ Boca Raton Dept of Physics
Experimental Phase Shifts in Magnetophonon Resonance,
John S. Blakemore, and John A. Kennewell. 25 Feb 74, 10p Rept no. 1307/75/1 AFOSR-TR-75-1137
Grant AF-AFOSR-2175-72
Availability: Pub. in Jnl. of Physics C: Solid States Physics, v8 p647-654 1975.

Descriptors: *Magnetoresistance, *Semiconductors, Solid state electronics, Magnetic fields, Phonons, Phase shift, Resonance, Reprints.
Identifiers: Landau levels, Effective mass.

Extremal positions in experimental recordings of the transverse magnetophonon resonance effect are usually phase-shifted with respect to magnetic fields that make the Landau level spacing a sub-multiple of the optical phonon energy. This phase shift arises from the amplitude variation of the resonance peaks. It is examined here as a feature of both differentiated and undifferentiated recordings; it is greater in the former case. Tables are presented that quote this shift for power law and exponential amplitude functions. (Author)

AD-A013 761/2GA PC$3.25/MF$2.25
Florida Atlantic Univ Boca Raton Dept of Physics
A Comparison of Methods for Measurement of the Magnetophonon Effect,
John S. Blakemore, Jaime A. Borras, and John A. Kennewell. 31 Dec 73, 7p Rept no. 1307/75/2 AFOSR-TR-75-1138
Grant AF-AFOSR-2175-72
Availability: Pub. in Jnl. of Physics E: Scientific Instruments, v8 n3 p227-231 Mar 75.

Descriptors: *Magnetic fields, *Magnetoresistance, *Semiconductors, *Phonons, Resonance, Indium antimonides, Measurement, Electron density, Sensitivity, Reprints.
Identifiers: *Magnetophonons.

In experimental studies of the magnetophonon resonance effect, the magnetic field dependence of the second derivative of sample resistance is desired. This is commonly done with a transverse field, and by making two R-C different ..tuons while the field varies with time at a programmed rate. An alternative and less widely used procedure superimposes a small sinusoidal modulating field upon a much larger static field, and makes phase-sensitive detection at the second harmonic frequency. This provides point by point data for the second derivative of resistance. The two methods are compared with reference to data for n-type InSb. (Author)

AD-A013 789/3GA PC$3.25/MF$2.25
Northeastern Univ Boston Mass Dept of Physics
Study of the Relationship between Electromagnetic and Elastic Properties of Solids and Fluids.
Final rept. 1 Nov 72-31 Dec 74,
Petros N. Argyres. Jan 75, 23p AFCRL-TR-75-0056
Contract F19628-73-C-0132

Descriptors: *Elastic properties, *Electromagnetic properties, Dielectrics, Mathematical models, Hamiltonian, Correlation techniques, Complex variables, Tensor analysis.

Three approaches to the central problem are discussed. The first is an unsuccessful attempt, which however provides a useful critique of projection operator techniques. The second is only a partially successful approach, through the use of a semiphenomenological model of a dielectric. The third, which is described in some detail, constitutes a successful approach and yields a very general and rigorous connection between the elastic and electromagnetic tensors of a very general model of a solid.

AD-A013 905/5GA PC$3.25/MF$2.25
Northwestern Univ Evanston Ill Dept of Physics
Hole Structure of Gray Tin under Tensile Stress,
W. Leung, and L. Liu. 31 Aug 74, 5p AFOSR-TR-75-1145
Grant AF-AFOSR-2731-74
Availability: Pub. in Solid State Communications, v16 n3 p285-288 1975.

Descriptors: *Holes(Electron deficiencies), *Semiconductors, Solid state physics, Tin, Mass, Electrons, Electron mobility, Energy bands, Tensile stress, Great Britain, Reprints.

The energy band structure for holes in gray tin under uniaxial tensile stress is discussed. It is shown that there is a region in the Brillouin Zone where the hole effective mass along the stress direction becomes negative. The structure of the constant energy surfaces is studied, and the number of holes contained in the energy surface is shown to obey a E3 law for small energy E. (Author)

AD-A013 940/2GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
X-Ray Lithography Applied to Silicon Device Fabrication.
Journal article,
Stephen E. Bernacki, and Henry I. Smith. 12 May 74, 14p Rept no. MS-3710 ESD-TR-75-187
Contract F19628-73-C-0002
Availability: Pub. in Proceedings of the Electron and ION Beam Science and Technology International Conference (6th), p34-46.

Descriptors: *Bipolar transistors, *Semiconductor diodes, X rays, Lithography, Silicon, Fabrication, Reprints.

This paper reports on the fabrication and performance of the first p-n junction diodes and bipolar transistors produced by x-ray lithography and the planar fabrication process. Also discussed are recent developments in x-ray mask fabrication techniques and the fabrication of submicron linewidth relief structures in thick PMMA. (Author)

AD-A013 947/7GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Screening by Fixed Charges in Compensated Semiconductors.
Journal article,
David M. Larsen. 2 Dec 74, 6p Rept no. JA-4459 ESD-TR-75-200
Contract F19628-73-C-0002
Availability: Pub. in Physical Review B, v11 n10 p3904-3909, 15 May 75.

Descriptors: *Semiconductors, *Charge carriers, Ions, Low temperature, Impurities, Scattering, Crystals, Gallium arsenides, Reprints.
Identifiers: Screening.

Donor and acceptor ions in compensated semiconductors at low temperatures are not completely randomly distributed--positive and negative charges tend to be closer to each other than allowed by chance. This gives rise to a kind of screening effect, which is usually taken into account in calculations by replacing the ion Coulomb potential by a Debye-type screened potential. We show that this replacement is wrong in principle; it leads to a statistical fluctuation of potential which is too small by a factor 2 and, at least in the case of small screening lengths, to a distribution of the total ion potential whose shape is substantially different from that obtained in a more fundamental calculation. (Author)

AD-A013 951/9GA PC$3.25/MF$2.25
Massachusetts Inst of Tech Lexington Lincoln Lab
Evidence for Localized Excitations in MgO from Electron Energy-Loss Spectroscopy.
Journal article,
Victor E. Henrich, and Gene Dresselhaus. 13 Jan 75, 5p Rept no. JA-4460 ESD-TR-75-201
Contract F19628-73-C-0002
Availability: Pub. in Solid State Communications, v16 n9 p1117-1120 1975.

Descriptors: *Magnesium oxides, *Electron spectroscopy, Solid state electronics, Electronic states, Band theory of solids, Excitation, Reprints.
Identifiers: Electron energy loss.

The excited electroniic states in the ionic crystal MgO have been studied by electron energy-loss spectroscopy. Structure observed above the thresholds for excitation from the Mg 2p, 2s, and 1s core levels shows the final states to be predominantly excitonic levels of the Mg(2+) ion. Comparison with the known states of the M2(2+) free ion indicates that solid-state shifts and splittings are small. (Author)

CONF-740997-2 PC$4.25/MF$2.25
Argonne National Lab., Ill.
Peak Effect and Flux Flow.
E. J. Kramer. 1974, 23p

Descriptors: (*Superconductors, *Magnetic flux), Critical current, Electrical properties, Mixed state.

For abstract, see NSA 32 03, number 07661.

DP-MS-75-8 PC$4.00/MF$2.25
South Carolina Univ., Columbia.
Neptunium Tetrabromide: A Moessbauer and Magnetic Susceptibility Study Below 20 exp 0 K.
J. L. Stevens, E. R. Jones, Jr, J. A. Stone, and D. G. Karraker. 1974, 9p CONF-750427-3
Contract AT(07-2)-1

Descriptors: (*Neptunium bromides, *Magnetic susceptibility), Antiferromagnetic materials, Curie-weiss law, Low temperature, Moessbauer effect, Neptunium 237, Ultralow temperature, Very low temperature.

For abstract, see NSA 32 03, number 07205.

ITF-75-18P PC$4.00/MF$2.25
AN Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
Application of the Collective Variable Method to the Ising Model. II. Investigation of the Behavior of the Pair Correlation Function in the Vicinity of the Phase Transition Point.
I. R. Yukhnovskii, and Yu. K. Rudavskii. 1975, 20p
In Russian. U.S. Sales Only.

Descriptors: (*Ferromagnetic materials, *Correlation functions), Diagrams, Mathematical operators, Phase transformations.

No abstract available.

JINR-E4-8448 PC$4.00/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Diagram Analysis of the Static and the Single-Site Approximations for the Hubbard Model.
W. Weller. 1974, 14p
U.S. Sales Only.

Descriptors: (*Metals, *Electronic structure), (*Dielectric materials, Electronic structure), Crystal lattices, Diagrams.

No abstract available.

JINR-P4-8466 PC$4.25/MF$2.25
Joint Inst. for Nuclear Research, Dubna (USSR). Lab. of Theoretical Physics.
Magnetic (Spin) and Magnetoelectric Point Groups of p Symmetry.
V. A. Koptsik, and I. N. Kotsev. 1974, 22p
In Russian. U.S. Sales Only.

Descriptors: (*Magnetic fields, *Spin), Rotation, Symmetry groups, Tables, Time dependence.

No abstract available.

NTIS/PS-75/661/9GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Ion Implantation (A Bibliography with Abstracts).
Rept. for 1964-Aug 75,
George Reimherr. Aug 75, 145p*

Descriptors: *Ion implantation, *Bibliographies, *Semiconductor doping, *Radiation effects, Semiconductor junctions, Radiation damage, Semiconductor devices, Silicon dioxide, Gallium arsenides, Abstracts.

The cited reports discuss research concerning ion implantation, particularly as applied to the microelectronics field. Specific topics include equipment, techniques, semiconductor doping, and radiation effects on material properties. (Contains 140 abstracts)

NTIS/PS-75/687/4GA
PC$25.00/MF$25.00
National Technical Information Service, Springfield, Va.
Squid Devices (A Bibliography with Abstracts).
Rept. for 1964-Jul 75,
George W. Reimherr. Sep 75, 64p*
See also NTIS/PS-75/590.

Descriptors: *Superconductors, *Bibliographies, Josephson junctions, Cryogenics, Magnetometers, Magnetic measurement, Microwave equipment, Radiofrequency power, Electric measuring instruments, Abstracts.
Identifiers: *Squid devices, SQUID(Superconducting Quantum Interference Devices), Superconducting quantum interference devices.

The cited reports discuss the theory, performance, and applications of the Superconducting Quantum Interference Devices, also called SQUID devices. (Contains 59 abstracts) See also NTIS/PS-75/590, Josephson Junctions.

N75-26822/7GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
The Magnetic Moment of the Proton.
B. G. Lasarew, and L. W. Schubnikow. Jun 75, 17p NASA-TT-F-16426

Contract NASW-2483
Tran-Transl. Into English from Physik. Z. Sowietunion (Kharkov), V. 11, 1937 p 445-457.

Descriptors: *Hydrogen, *Magnetic moments, *Magnetic permeability, *Protons, *Solidified gases, Nuclear magnetic resonance, Numerical analysis, Tables (Data), Temperature gradients.

For abstract, STAR 1317

N75-26885/4GA PC$4.75/MF$2.25
Eidgenossische Technische Hochschule, Zurich (Switzerland).
Bound and Scattering States in the Heisenberg Ferromagnet.
Ph.D. Thesis.
J. F. Perez. 1973, 97p REPT-5137

Descriptors: *Ferromagnetism, *Heisenberg theory, *Magnons, *Spin dynamics, Atomic energy levels, Atomic excitations, Hamiltonian functions, Quantum mechanics, Wave scattering.

For abstract, STAR 1317

N75-26888/8GA PC$3.75/MF$2.25
Colorado Univ., Boulder. Photoconductive Semiconductors and Devices Lab.
Ion-Implanted Epitaxially Grown ZnSe.
Final Report, 1 May 1974 - 30 Apr. 1975.
F. Chernow. 30 Apr 75, 49p NASA-CR-143086
Grant NSG-1037

Descriptors: *Epitaxy, *Ion implantation, *P-i-n junctions, *P-n junctions, *Zinc selenides, Graphs (Charts), Holes (Electron deficiencies), P-type semiconductors, Radiative recombination, Space charge, Wavelengths.

For abstract, STAR 1317

N75-26889/6GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Moessbauer Studies in Zinc-Manganese Ferrites for Use in Measuring Small Velocities and Accelerations with Great Precision.
W. T. Escue, R. G. Gupta, and R. G. Mendiratta.
13 Jun 75, 35p NASA-TM-X-64944

Descriptors: *Ferrites, *Manganese compounds, *Mossbauer effect, *Zinc compounds, Ferrimagnetism, Hyperfine structure, Interstitials, Magnetic fields, Magnetic relaxation, Spectroscopic analysis.

For abstract, STAR 1317

PB-243 929/7GA PC$6.25/MF$2.25
California Univ., Berkeley. Structural Engineering Lab.
On Identification and Prediction of Dynamical Systems Governed by Nonlinear Hyperbolic Integro-Differential Equations of Volterra Type.
Technical rept.,
I. H. Lin, and J. L. Sackman. Dec 73, 158p
SESM-73-15
Sponsored in part by National Science Foundation, Washington, D.C., and Calif. Univ., Livermore, Lawrence Livermore Lab.

Descriptors: *Materials tests, *Impact tests, *Viscoelasticity, *Hyperbolic differential equations, Partial differential equations, Nonlinear differential equations, Volterra equations, Numerical integration.
Identifiers: Powell method, Unconstrained optimization.

A method is developed for the identification of the dynamic properties of nonlinear viscoelastic materials using transient response information arising from impact tests. The solutions of the identification problem and that of the associated nonlinear wave propagation problem are shown to be coupled. They are accomplished via application of the method of lines, the Runge-Kutta-Pouzet integration scheme with automatic step size control and Powell's method of unconstrained optimization. Numerical experiments are performed to demonstrate the feasibility, accuracy and stability of the solution procedure established, and wave propagation experiments are conducted to investigate the applicability of the method to a real physical system. The results are of particular interest in the modeling of nonlinear viscoelastic materials and the identification of systems governed by nonlinear hyperbolic partial-integro-differential equations.

20M. Thermodynamics

AD-A013 906/3GA PC$3.25/MF$2.25
National Bureau of Standards Washington D C
Thermodynamic Studies of the Alpha-to-Beta Phase Transformation in Zirconium Using a Subsecond Pulse Heating Technique,
A. Cezairliyan, and F. Righini. 5 Sep 74, 5p
AFOSR-TR-75-1136
Availability: Pub. in Jnl. of Research of the National Bureau of Standards, A, v79A n1 p81-84 Jan-Feb 75.

Descriptors: *Thermodynamics, *Zirconium, *Phase transformations, *Electrical resistivity, Electrical measurement, Pulses, Heating, Energy, Solids, Electric current, High velocity, Photoelectric pyrometers, Reprints.
Identifiers: *Subsecond pulse heating technique, Solid-solid phase transformations.

Measurements of the temperature and energy of the Alpha-to Beta phase transformation, and the electrical resistivity near and at the transformation point of zirconium using a subsecond duration pulse heating technique are described. The results yield 1147 K for the transformation temperature and 3980 J mol(-1) for the transformation energy. Electrical resistivity is found to decrease by 17 percent during transformation. Estimated inaccuracies of the measured properties are: 10 K for the transformation temperature, 5 percent for the transformation energy, and 2 percent for the electrical resistivity.

AD-A014 027/7GA PC$3.25/MF$2.25
Rosenstiel School of Marine and Atmospheric Science Miami Fla
The Equation of State of Seawater,
Rana A. Fine, Dong-Ping Wang, and Frank J. Millero. 11 Feb 74, 25p
Contract N00014-67-A-0201, Grant NSF-GA-17386
Availability: Pub. in Jnl. of Marine Research, v32 n3 p433-456, 15 Sep 74.

Descriptors: *Sea water, Equations of state, Computations, Reprints.

The P-V-T properties of seawater calculated from the sound derived equation of state of Wang and Millero (1973) are compared with the data of various workers.

CONF-750120-1 PC$5.25/MF$2.25
Argonne National Lab., Ill.
Sound Propagation in Normal and Superfluid exp 3 He.
J. B. Ketterson, P. R. Roach, B. M. Abraham, and P. D. Roach. 1975, 43p
Contract W-31-109-Eng-38

Descriptors: (*Helium 3, *Superfluidity), Anisotropy, Order parameters, Sound waves, Temperature dependence, Wave propagation.

For abstract, see NSA 32 03, number 07653.

N75-26790/6GA PC$3.25/MF$2.25
Oxford Univ. (England). Cryogenics Lab.
A Modification to the Hsu Model for Finding the Size Range of Nucleation Sites on a Heated Surface.
W. B. Bald. Sep 73, 16p OUEL-1112/74

Descriptors: *Boiler plate, *Bubbles, *Heat balance, *Nucleate boiling, Cryogenic fluids, Equations of motion, Gas-liquid interactions, Growth, Heat transfer, Liquid-vapor interfaces, Supercooling.

For abstract, STAR 1317

N75-26904/3GA PC$5.25/MF$2.25
Eidgenossische Technische Hochschule, Zurich (Switzerland).
Isothermal Calorimetry for Thermodynamic and Kinetic Measurement.
Ph.D. Thesis.
H. Weber. 1974, 118p REPT-5098

Descriptors: *Calorimeters, *Heat measurement, *Isothermal processes, *Thermodynamics, Analog computers, Kinetic theory, Linear systems, Mathematical models, Problem solving, Thermochemistry.

For abstract, STAR 1317

20N. Wave Propagation

AD-A013 775/2GA PC$5.75/MF$2.25
Tetra Tech Inc Pasadena Calif
Analytical and Numerical EMP Coupling Solutions for a Class of Structures Attached to the Wing of an Aircraft.
Final rept. Jun 74-Sep 74,
M. I. Sancer, and A. D. Varvatsis. Jul 75, 128p
AFWL-TR-74-298
Contract F29601-74-C-0120

Descriptors: *Electromagnetic pulses, Coupling(Interaction), Aircraft, Coding, Computer programming, Wings, Electric current.

A description is presented on the analysis necessary to develop a large EMP coupling computer code. The analysis for two models of the wing is contained in this note; however, the code was only developed dor the simpler wing model. The code calculates EMP-induced surface current densities on the attached structure as well as aperture-excited voltages and currents on a cable or cable bundle that is interior to the circular cylindrical portion of the structure. Also contained in the code is an option to isolate the circular cylinder and to calculate new numerical results for this well studied and useful model.

AD-A013 850/3GA PC$3.75/MF$2.25
Dikewood Corp Los Angeles Calif
Exact Solution of the Problem of Quasi-Static Electric Field Penetration into a Hemispherical Indentation in an Infinite Conducting Plane.
Final rept. 28 Sep 73-24 Jul 74,
John Lam. Jul 75, 30p AFWL-TR-74-248
Contract F29601-74-C-0010

Descriptors: *Electromagnetic wave propagation, *Electric fields, Cavities, Aircraft antennas, Hemispheres, Electrostatics, Penetration.

The problem of the penetration of a quasi-static electric field into a hemispherical indentation in an infinite conducting plane is solved exactly. The results are directly applicable to the study of a large class of aircraft antennas; for example, the marker beacon antenna. The solution is obtained by an inversion transformation on the known solution for the problem of a conducting right-angled wedge excited by an electric dipole. A closed form for the electrostatic potential is derived. The value of the potential, the electric surface charge density, the induced dipole moment of the cavity, and the averaged electric field over the length of a thinwire stub antenna erected from the cavity bottom are calculated. It is found that the penetration electric field strength at the cavity bottom is about 10 percent of that of the external field, while the averaged field on the symmetry axis varies from 10 to 28 percent.

AD-A013 851/1GA PC$3.75/MF$2.25
Dikewood Corp Los Angeles Calif
Quasi-Static Magnetic Field Penetration into a Hemispherical Indentation in an Infinite Conducting Plane.
Final rept. 28 Sep 73-24 Jul 74,
John Lam. Jul 75, 36p AFWL-TR-74-249
Contract F29601-74-C-0010

Descriptors: *Electromagnetic wave propagation, *Magnetic fields, Cavities, Aircraft antennas, Loop antennas, Hemispheres, Integral equations, Numerical analysis, Magnetostatics, Penetration.

The problem of the penetration of a quasi-static magnetic field into a hemispherical indentation in an infinite conducting plane is formulated as an integral equation and solved numerically to a high degree of accuracy. The results are directly applicable to the study of a large class of aircraft antennas, such as the marker beacon antenna. The value of the magnetic potential inside the cavity, the induced magnetic dipole moment, and the magnetic flux passing through a receiving loop antenna erected in the cavity are calculated.

AD-A013 863/6GA PC$4.75/MF$2.25
Army Engineer Topographic Labs Fort Belvoir Va
Backscattering of Electromagnetic Waves from a Slightly Rough Surface with a Lossy Layer.
Technical rept.
Dec 74, 97p Rept no. ETL-TR-74-10

Descriptors: *Backscattering, *Electromagnetic radiation, *Dielectric properties, *Surface roughness, Losses, Radiation attenuation, Polarization, Computer programs, Fortran, Integral equations, Fourier transformation, Perturbation theory, Ice, Roads, Radar signals, Interfaces.
Identifiers: Layered media, Horizontal polarization, Vertical polarization, Propagation constant.

The purpose of this report is to analyze the problem of electromagnetic wave scattering from a layer which is rough on both sides. A general vector theory is developed for horizontal and vertical polarizations in which use is made of the Fourier transform and the small perturbation theory. Although there has been a great deal of work performed in the area of electromagnetic wave scattering from plane-layered media, there has been very little work on the problem of wave scattering from a layer which has both interfaces rough. A solution to this problem is important if one is interested in such things as radar scattering from a layered road surface or from a terrain surface covered with ice. There are many other applications in which a solution to this problem would be of great aid.

COM-75-10799/5GA PC$5.25/MF$2.25
Office of Telecommunications, Boulder, Colo. Inst. for Telecommunication Sciences.
Man-Made Radio Noise. Part II. Bibliography of Measurement Data, Applications, and Measurement Methods,
Arthur D. Spaulding, Robert T. Disney, and A. G. Hubbard. May 75, 109p OTR-75-63
Paper copy also available from GPO. See also Part 1 dated June 74, COM-75-10798.

Descriptors: *Manmade radiofrequency interference, *Bibliographies, Measurement, Mathematical models, Data, Atmospherics, Electromagnetic noise.

The Office of Telecommunications, Institute for Telecommunication Sciences (OT/ITS), over the past several years, has accumulated a data base of man-made radio noise measurements in the frequency range from 250 kHz to 250 MHz taken in a number of geographical areas. Man-made Radio Noise, Part I (OT Report 74-38) gives the results of the analysis of this base and provides estimates of the man-made noise levels and characteristics to be expected in typical locations. This part of the report (Part II) is a compilation of references relating to man-made radio noise. This bibliography is divided into five sections: Section I, Measurements and Data; Section II, Applications to Systems and Mathematical Modeling; Section III, Measurement Experiments and Methods; Section IV, General; and Section V, Atmospheric Radio Noise.

21. PROPULSION AND FUELS

21A. Air-Breathing Engines

AD-A014 002/0GA PC$6.25/MF$2.25
Michigan Univ Ann Arbor Computer Information and Control Engineering
Modelling and Identification of Relatively Slowly Varying Systems.
Doctoral thesis,
Philip Howard Fiske. Apr 75, 163p Rept no. UMICH-011306 AFOSR-TR-75-1103
Grant AF-AFOSR-2328-72

Descriptors: *Control theory, Identification, Linear systems, Nonlinear systems, Systems analysis, Volterra equations, Stochastic processes, Mathematical models, Theses.
Identifiers: Time varying systems.

This thesis is concerned with the modeling and identification of a large class of nonlinear, time-varying, causal, bounded memory systems. A generic model is developed for such time-varying systems, and this model is formulated in terms of a finite set of parameters which adequately describe the unknown system mapping. Two separate models are considered for the variation in the parameters representing the unknown system. In the first, the variation is assumed to be unknown but bounded between measurement times, and in the second, the variation between measurement times is taken to be random, with known mean and covariance. In each case, two methods of processing the observations are considered.

21B. Combustion and Ignition

AD-A013 738/0GA PC$3.75/MF$2.25
Aerospace Corp El Segundo Calif Vehicle Engineering Div
An Analytical Model for a Two-Phase Vacuum Plume.
Final rept.,
B. E. Pearce. 30 Jun 75, 40p Rept no. TR-0075(5901-01)-5 SAMSO-TR-75-204
Contract F04701-74-C-0075

Descriptors: *Solid propellant rocket engines, *Plumes, Impingement, Kinetic energy, Flow fields, Particle flux, Mathematical models, Solid rocket propellants.

A simple analytical model is proposed that specifies the gas and particle mass, momentum, and kinetic energy fluxes in a two-phase vacuum plume from a solid propellant rocket motor. The objective is to provide a description of the undisturbed plume structure for use in plume impingement assessments. Analytical expressions for the angular and radial dependence of the gas and particle flows are chosen based on a comparison with two-phase method-of-characteristics solutions and a spherical source flow model for plumes at large distances (more than 10 exit radii) from the nozzle exit. The model accurately predicts the gas mass flux but overpredicts the gas momentum flux. Both the particle mass and momentum flux are underpredicted by from 12 to 33 percent in the cases examined. A comparison with other approximate models for two-phase plumes suggests the model described herein offers improved accuracy and a more realistic specification of the spatial structure of both the gaseous and particle plumes.

AD-A013 845/3GA PC$3.75/MF$2.25
Maryland Univ College Park Dept of Aerospace Engineering
Nonequilibrium Effects in Kerosene-Oxygen Rocket Nozzle Flows,
John S. Vamos, and John D. Anderson, Jr. Jun 75, 32p Rept no. AE-75-4 AFOSR-TR-75-1189
Grant AF-AFOSR-2575-74

Descriptors: *Rocket exhaust, Plumes, Nozzle gas flow, Chemical equilibrium, Temperature, Numerical analysis, Reaction kinetics.

Nonequilibrium flow calculations were made for a small rocket engine burning kerosene and oxygen. Such rockets can be used in the laboratory for producing plumes under controlled experimental conditions. A time-dependent finite-difference technique was used to calculate the chemical nonequilibrium flow throughout the nozzle, including nonequilibrium conditions both upstream and downstream of the nozzle throat. Cases were computed for oxidizer/fuel ratios from 1.6 to 5. The results indicated that the principal chemical species (CO_2, H_2O and CO) deviated from equilibrium by about 20% at the nozzle exit. Of particular importance is the nonequilibrium gas static temperature, which is approximately 400K less than equilibrium conditions.

AD-A013 855/2GA PC$4.25/MF$2.25
Rockwell International Corp Mcgregor Tex Rocketdyne Div
Role of Ferric Oxide Surface Area in Propellant Burn Rate Enhancement (First Step Toward Modeling).
Final rept. 1 Jul 74-30 Jun 75,
C. H. Burnside. 30 Jun 75, 62p Rept no. R-4889 AFOSR-TR-75-1188
Contract F44620-75-C-0002

Descriptors: *Solid rocket propellants, *Combustion, *Ammonium perchlorate, *Iron oxides, Surfaces, Burning rate, Catalysts, Particle size.

Results of efforts to correlate composite propellant burn rate, ammonium perchlorate particle size distribution, and ferric oxide specific surface and level are presented. Results from laboratory-scale motor firings with HTPB- and CTPB-based propellants containing ferric oxides of 3 to 26.4 m squared/gm were used. The oxides had been prepared by precipitation and by calcination of either ferric sulfate or yellow iron oxide. Outcome of the analysis is a quantitative summarization of a mass of data showing how the several oxides

perform in terms of their specific surface and level and as a function of oxidizer particle size distribution. Results indicate Fe2O3 specific surface is more significant at high fine-AP levels than at low fine-AP levels. Efforts to use the correlations in combustion modeling have barely begun. Catalysis probably takes place in the primary diffusion flame located at the AP-binder interface.

AD-A013 876/8GA PC$3.75/MF$2.25
Princeton Univ N J Dept of Aerospace and Mechanical Sciences
Abstracts of Presentations for Air Force Office of Scientific Research (AFOSR) Contractors Meeting on Rocket Combustion Dynamics and Electric Combustion Phenomena (1975). Held at Lancaster, California and Edwards AFB, California on 22-25 July 1975.
Interim rept. Jul 74-Jul 75,
Leonard H. Caveny. Jul 75, 43p AFOSR-TR-75-0830
Grant AF-AFOSR-2602-74

Descriptors: *Rocket propellants, *Combustion, *Meetings, Abstracts, Solid rocket propellants, Thrusters, Ion engines, Plasma engines, Rocket exhaust, Plumes.
Identifiers: *Colloid thrusters.

This volume contains abstracts of presentations on continuing researches and technology assessments that encompasses: electric propulsion phenomena (including colloid thrusters, pulsed ablative arc discharge, and plasmas); nonsteady combustion processes in rockets, metals combustion, nitramine propellants, deflagration to detonation transition, ultrasonic emissions from flames, monopropellant thrusters, exhaust plumes, and external burning.

AD-A013 912/1GA PC$4.75/MF$2.25
Pratt and Whitney Aircraft West Palm Beach Fla Florida Research and Development Center
Investigation of Centrifugal Force and Reynolds Number Effects on Combustion Processes.
Final rept. Jun 73-Jun 75,
George D. Lewis, and Clifford E. Smith. Jun 75, 85p Rept no. PWA-FR-6996 AFOSR-TR-75-1167
Contract F44620-73-C-0061
See also report dated Aug 74, AD-787 865.

Descriptors: *Combustion, *Flame propagation, Centrifugal force, Flames, Combustion stability, Centrifuges, Reynolds number, Turbulence, Turbofan engines, Thrust augmentation, Computer programs, FORTRAN.
Identifiers: *Swirl augmentors.

Tests in a combustion centrifuge have demonstrated that increased buoyancy produced by centrifugal force can be used to increase flamespeeds significantly over turbulent flamespeed, which controls combustion rates in conventional burners. A model has been developed that predicts the flamespreading rate at various burner conditions. In addition, a second model, based on classical heat transfer correlations, has been developed to predict with reasonable accuracy the extinction limits of flames at very high centrifugal force values. The effects of Reynolds number on turbulent flamespeeds and on limiting bubble sizes in gravitational fields have also been measured. Testing of a subscale swirl augmentor has confirmed the validity of the experimental model and it has been used to design a full-scale augmentor for advanced versions of an Air Force turbofan engine. The swirl augmentor is predicted to reduce the fuel consumption and increase the stability of the engine.

AD-A013 933/7GA PC$4.25/MF$2.25
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
NO2 Combustor Emissions Investigation.
Technical rept. Oct 73-Feb 75,
Dennis E. Walsh. May 75, 68p Rept no. AFAPL-TR-75-46

Descriptors: *Nitrogen oxides, *Combustion, *Exhaust gases, Aircraft engines, Reaction kinetics, Chemical reactions, Air pollution, Oxidation.
Identifiers: *Nitrogen dioxide, Aircraft exhaust, Chemical reaction mechanisms.

This report presents the results of an experimental program investigating the possibility of NO2 formation within the burners of aircraft gas turbine engines. An environment resembling the cooler regions of the combustor (e.g., the cooling layer) was established to test a proposed mechanism involving: (1) transport of NO from a 'hot' combustor section into a region more thermodynamically favorable for NO2 formation, e.g., the cooling layer, and (2) subsequent reaction of the NO to form NO2 either homogeneously or under the influence of catalysis (heterogeneous or homogeneous). Results of experiments conducted examining this possibility revealed that under the action of hydrocarbons, significant amounts of NO can be oxidated to NO2. The role of Drierite on NO2 adsorption was also investigated. An unverified explanation of this phenomenon is presented involving reaction of NO2 and H2O to HNO3 and NO.

AD-A013 974/1GA PC$4.25/MF$2.25
Foreign Technology Div Wright-Patterson AFB Ohio
Experimental Study Method of the Combustion of a Spinning Metallized Solid Propellant,
B. Doin, J. Brulard, and P. Larue. 15 Jul 75, 75p Rept no. FTD-ID(RS)I-1543-75
Edited trans. of Recherches Aerospatiales, Chatillon (France) n229 p1-38 1974.

Descriptors: *Solid propellants, *Combustion, Spinning(Motion), Aluminized propellants, Thrust, Pressure, Specific impulse, Translations, France.

Description and capabilities of the set-ups developed for studying experimentally, from microscopic scale to full engine size, the influence of rotation on the combustion of a metallized solid propellant. Small scale tests on samples make possible the determination of a critical value for the diameter of aluminum droplets, at which the combustion kinetics of the metal remain unchanged. Tests on 'rings' make possible the quantitative characterization of the propellant sensitivity to acceleration.

AD-A014 046/7GA PC$3.25/MF$2.25
Army Foreign Science and Technology Center Charlottesville Va
The Mechanism of Catalyzer Action on the Burning of Condensed Systems,
O. P. Korobeinichev, A. M. Viktorenko, A. G. Tereshchenko, and N. N. Kolomeichuk. 30 Apr 75, 15p Rept no. FSTC-HT-23-148-75
Unedited trans. of Fizika Goreniya i Vzryva (USSR) v8 p511-517 1972.

Descriptors: *Ammonium perchlorate, *Combustion, Catalysts, Surfaces, Oxides, Reaction kinetics, Iron oxides, Copper compounds, USSR, Translations.
Identifiers: Copper oxides.

A considerable number of works have been devoted to a study of the catalysis mechanism in the burning of condensed mixtures on the base of ammonium perchlorate (AP). There is no single point of view on this question. The data of some authors confirm the gas-phase mechanism for the action of the catalyst while experiments indicate that the place of action of the catalyst is the condensed phase. The theory of the strongest possible catalyst in the gas phase predicts the strong dependence of the catalyst's effectiveness on its dispersion. This work is devoted to an experimental study of the mechanism of the catalyst's action on the burning of condensed systems on the base of AP.

N75-26064/6GA PC$3.75/MF$2.25
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt, Brunswick (West Germany). Inst. fuer Antriebssysteme.
Theoretical and Experimental Investigations on Heat Input Burning Triethyl Aluminum in Airflows.
M. Kallergis, and M. Ahlswede. 1975, 47p DLR-FB-75-05
In German; English Summary.

Descriptors: *Combustion chambers, *Flame stability, *Organic aluminum compounds, *Pyrophoric materials, *Triethyl compounds, Combustion temperature, Fuel-air ratio, Heat of combustion, Ignition, Mass flow.

For abstract, STAR 1317

21D. Fuels

AD-A013 932/9GA PC$3.75/MF$2.25
Air Force Aero Propulsion Lab Wright-Patterson AFB Ohio
Study of Estimation Methods for Hydrogen Content and Heat of Combustion of Aviation Turbine Fuels.
Final technical rept. Dec 73-Mar 74,
Leonard C. Angello. May 75, 41p Rept no. AFAPL-TR-74-76

Descriptors: *Jet engine fuels, *Heat of combustion, Hydrogen, Measurement.
Identifiers: *Hydrogen content, JP-4 fuel, Jet A fuel.

The value of using the hydrogen content of jet fuel as a measure of the fuel's combustion performance and an evaluation of the use of correlation equations to accurately calculate a fuel's hydrogen content based on other measured fuel properties (aniline point and gravity) have been documented. Subsequently, new correlation equations for calculating the hydrogen content and the heat of combustion of jet fuels have become available. It is the purpose of this report to evaluate these new equations and to determine their suitability for use in jet fuel specifications. A study was performed to determine the suitability of several newly developed equations for calculation of hydrogen content and net heat of combustion of JP-4 and Jet A fuels. Results of the evaluation indicate that two of the five hydrogen content equations and three of the four net heat of combustion equations are unconditionally acceptable for both JP-4 and Jet A fuels.

N75-26149/5GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Fuel for Compression Micromotors.
A. V. Babichev. Jul 75, 2p NASA-TT-F-16446
Contract NASW-2481
Tran-Transl. Into English from Russian Patent No. 247713 (Appl. No. 1085220/23-4, 23 Jun. 1966) 1 p.

Descriptors: *Fuels, *Micromotors, Aircraft models, Ground effect machines, Internal combustion engines.

For abstract, STAR 1317

N75-26150/3GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.

Process for the Production of Highly Pure Methanol Fuels with Castor Oil Content.
L. Kapavik, and J. Weigner. Jul 75, 3p NASA-TT-F-16447
Contract NASW-2481
Tran-Transl. Into English from Czechoslovak Patent Specification No. 144460 (15 Dec. 1967) 2 p.

Descriptors: *Aircraft models, *Castor oil, *Methyl alcohols, Aircraft engines, Engine parts, Filters.

For abstract, STAR 1317

PAT-APPL-503 537/GA PC$3.25/MF$2.25
Energy Research and Development Administration, Washington, D.C.
Process for Pretreatment of Coal During Transport to Reduce Agglomeration.
Patent Application,
Glenn E. Johnson. Filed 5 Sep 74, 13p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Coal preparation, *Caking, *Patent applications, Oxygenation.
Identifiers: Decaking.

Many available coals are 'caking coals' which possess the undesirable characteristic of fusing into a solid mass when heated through their plastic temperature range (about 400C) which temperature range is involved in many common treatment processes such as gasification, hydrogenation, carbonization and the like. Unless the caking properties are first destroyed, the coal cannot be satisfactorily used in such processes. A process is disclosed for decaking finely divided coal during its transport to the treating zone by propelling the coal entrained in an oxygen-containing gas through a heated transport pipe whereby the separate transport and decaking steps of the prior art are combined into a single step.

PB-243 413/2GA PC$7.50/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Quantitative Methods.
National Petroleum Product Supply and Demand: 1975.
Quarterly rept. Oct-Dec 75.
25 Mar 75, 227p* FEA-EATR-75-5 FEA/B-75/271

Descriptors: *Petroleum products, Supply(Economics), Demand(Economics), Econometrics, Crude oil, Gasoline, Distillates, Residual oils, Kerosene, Napthas, Liquefied gases, Jet engine fuels, Forecasting.
Identifiers: Feedstocks.

This report presents a documentation of the short-term petroleum product supply and demand forecasting methodology used at the Federal Energy Administration. In addition, two petroleum product supply and demand forecasts are presented for the period February through June 1975 by month and for the remainder of 1975 by quarter. The two forecasts represents a base case and a policy option case which incorporates most of the policy actions outlined by the President in the energy portion of the State of the Union Message, January 15, 1975.

PB-243 576/8GA PC$7.00/MF$2.25
Federal Energy Administration, Washington, D.C. Office of International Energy Affairs.
The Relationship of Oil Companies and Foreign Governments.
Jun 75, 197p* FEA/M-75/280

Descriptors: *International relations, *Petroleum industry, *International trade, History, Forecasting, Foreign government, Algeria, Australia, Belgium, Canada, Denmark, Ecuador, France, Gabon, Germany, Indonesia, Iran, Iraq, Italy, Japan, Kuwait, Libya, Malaysia, Mexico, Netherlands, Nigeria, Norway, Qatar, Saudi Arabia, Spain, Sweden, United Arab Emirates, United Kingdom, USSR, Venezuela, Government policies, Energy policy.

This report analyzes the relationships between private oil companies and governments in both producing and consuming countries. Thirty countries were selected to provide a comprehensive view of foreign nations, both producers and consumers. All members of OPEC are included as are most members of the International Energy Agency. The report covers the period from the mid-1950's, when a handful of major international companies dominated the international petroleum system to early 1975, when OPEC governments unilaterally seized control of international oil pricing and escalated demands to virtually complete nationalization of the petroleum industry's crude production facilities within OPEC.

PB-243 795/2GA PC$3.25/MF$2.25
Bureau of Mines, Pittsburgh, Pa. Pittsburgh Mining and Safety Research Center.
Coal-Pyrite Flotation: A Modified Technique Using Concentrated Second-Stage Pulp.
Technical progress rept.,
Kenneth J. Miller. May 75, 16p BuMines-TPR-91
Report on Coal Preparation Program. See also report dated Sep 73, PB-224 571.

Descriptors: *Coal preparation, *Desulfurization, *Flotation, *Pyrite, Froth, Pilot plants, Flotation reagents, Potassium organic compounds, Xanthates.

The Bureau of Mines two-stage coal-pyrite flotation process was modified to provide a more concentrated final clean coal slurry underflow that could be dewatered economically by filtration or centrifugation. This was accomplished by doing the first-stage coal flotation step in the conventional manner with a slurry of about 8 percent solids but running the second-stage pyrite flotation step with undiluted coal froth concentrate containing about 25 percent solids. The final clean coal underflow produced by the new technique contained between 26 and 30 percent solids; this pulp was sufficiently concentrated to be filtered industrially without further thickening. Sulfur removal was equal to that obtained using dilute second-stage pulp.

PB-243 921/4GA PC$4.25/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Energy Data Policy.
Petroleum Market Shares. A Progress Report on the Retailing of Gasoline.
6 Aug 74, 56p* FEA/C-74/99

Descriptors: *Gasoline, *Retailing, *Market shares, Automotive fuels, Diesel fuel, Petroleum products, Petroleum industry, Marketing, Sales, Market share reports.

The report is comprised of three major sections: data currently available from industry; data comparisons; and descriptions and rationale for an FEA market share monitoring program. The latter part of this report is a rationale and description of FEA's development of capabilities to monitor changes of both petroleum marketing and distribution. The objective is to provide an ongoing system that reliably measures market shares. Included in the text are discussions of: Previously reported data on gasoline sales; survey of nonbranded independent marketers; company direct sales and independent marketers; gasoline and diesel fuel; and other petroleum products.

PB-243 922/2GA PC$3.75/MF$2.25
Federal Energy Administration, Washington, D.C. Office of Energy Statistics.
A Report on the Federal Energy Administration Survey of Refiners and Importers of Gasoline.
28 Aug 74, 35p* FEA/C-74/104

Descriptors: *Gasoline, *Refineries, *International trade, *Market share, Petroleum industry, Imports for consumption, Sales, Marketing, Market share reports.
Identifiers: Importers.

This one-time report by the Federal Energy Administration presents data and findings from the initial returns of the FEA survey of refiners and importers of motor gasoline. Changes since January 1972 in the distribution of product by non-refining importers and three groups of refiners are analyzed. The analysis of sales is presented according to three marketing categories: (1) Sales through refiner operated retail outlets; (2) other direct sales to end-users (e.g., national consumer accounts); and (3) sales to independent marketers. For each sales category, the volume share of each of the following groups is presented: (1) Large integrated refiners; (2) large independent refiners; (3) small independent refiners; and (4) nonrefining importers.

21E. Jet and Gas Turbine Engines

AD-A013 729/9GA PC$3.75/MF$2.25
Rand Corp Santa Monica Calif
Performance/Schedule/Cost Tradeoffs and Risk Analysis for the Acquisition of Aircraft Turbine Engines: Applications of R-1288-PR Methodology,
J. R. Nelson. Jun 75, 26p Rept no. R-1781-PR
Contract F44620-73-C-0011
See also AD-780 636.

Descriptors: *Aircraft engines, *Turbines, *Air Force procurement, *Logistics planning, Trade off analyses, Weapon systems, Performance, Scheduling, Cost analysis, Risk, Turbofan engines, Afterburning.
Identifiers: Cost models, Risk analysis, *Logistics management, Rolls Royce RB 211 engines.

The report discusses two applications of a cost-estimating model that incorporates quantitative measures of an engine's performance. A summary measure, called time of arrival (TOA), can be used in the decisionmaking process to trade off performance, schedule, and cost during the conceptual phase of aircraft turbine engines. The author briefly reviews the TOA measure and cost-estimating methodologies and then presents a tradeoff and risk analysis of two present-day programs: the Rolls Royce RB211 engine program and a new, hypothetical, afterburning turbofan engine program. The analysis indicates: (1) The cost growth for the RB211 was due to an ambitious British program, in terms of performance level demanded for the specific schedule desired. (2) A schedule requiring a new engine 'ahead of its time' results in a higher cost if it is achieved; it also exposes the engine, and the entire weapon system, to a higher risk of performance shortfall, schedule slippage, and cost growth. Future plans include an extension of teh TOA methodology to the assessment of ownership costs for engines.

AD-A013 834/7GA PC$5.25/MF$2.25
General Electric Co., Cincinnati, Ohio. Aircraft Engine Group.
Integral Engine Inlet Particle Separator. Volume I. Technology Program.
Final rept.,
Robert J. Duffy, and Bernard F. Shattuck. Jul 75, 112p USAAMRDL-TR-75-31A
Contract DAAJ02-73-C-0004

Descriptors: *Turboshaft engines, *Separators, Engine air systems components, Turbojet inlet

screens, Inlet guide vanes, Ingestion(Engines), Helicopter engines, Dust, Sand, Foliage, Adverse conditions, Model tests.

Volume I of this report describes the results of a 30-month program to design and evaluate integral engine inlet separators in 2, 5, and 15 lb/sec sizes. The separators are designed to remove sand, dust, and single foreign objects from the air entering a turboshaft engine. Program effort included: (1) Definition of turboshaft engine environment in terms of amounts and types of ingested materials. (2) Mechanical and aerodynamic design trade-off studies of integral engine separators followed by full-scale model performance tests of 2 and 15 lb/sec separators. (3) Detailed design and procurement of 2, 5, and 15 lb/sec separators, and design and procurement of improved components. (4) Model tests of the separators to obtain detailed aerodynamic and off-design performance data. (5) Preparation of a separator design guide for integral engine separators in the 2 to 15 lb/sec size range. The design guide (including environment definition) is presented in Volume II of this report. Volume I documents all other aspects of the program.

COM-75-50434/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
An Automated Prototype Test System for Aircraft Engine Fuel Controls, Design and Operating Experience.
Final rept.,
David W. Baker, and Alfred L. Koenig. 1974, 11p
Sponsored in part by Naval Air Systems Command, Washington, D.C.
Pub. in Proceedings of Annual Technical Symposium, Chapter of Association for Computing Machinery (13th), Washington, D.C., 20 Jun 74, pB.4.1-B.4.11 1974.

Descriptors: *Turbofan engines, *Fuel systems, *Automatic control equipment.
Identifiers: T-30 engines, TF-30 engines, *Minicomputers.

The adjustment and calibration of the fuel control, the accessory which meters flow to the engine burners, requires long-term bench tests involving many often repeated manual oerations. Minicomputer-based hardware and software systems, developed during 1968-1971, which control an existing production test stand are reviewed. The system automating this stand, used in the rework of TF-30 engine controls, simulate engine parameters burner pressure and drive shaft speed using supervisory control. Also, metered fuel flow is measured and read out. An auxiliary panel at the test stand containing readout and input devices enables the operator to run the test. This prototype system has served as basis for two test systems, under contract and slated for production, which will automate nine stands.

N75-25943/2GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Particulate Exhaust Emissions from an Experimental Combustor.
C. T. Norgren, and R. D. Ingebo. Jun 75, 12p NASA-TM-X-3254, E-8300

Descriptors: *Combustion chambers, *Exhaust gases, Carbon, Filters, Gas chromatography, Gas turbine engines, Glass fibers, Smoke.

For abstract, STAR 1317

N75-25944/0GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Turbofan Compressor Dynamics During Afterburner Transients.
A. P. Kurkov. 1975, 17p NASA-TM-X-71741, E-8375
Conf-Presented at the Symp. On Unsteady Phenomena in Turbomachinery, Monterey, Calif. 22-26 Sep. 1975; Sponsored by AGARD Propulsion and Energetics Panel.

Descriptors: *Afterburning, *Compressors, *Dynamic characteristics, *Turbofans, Compressor efficiency, Engine failure, High altitude environments, Simulated altitude, Test chambers, Tf-30 engine.

For abstract, STAR 1317

N75-25946/5GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Wind Tunnel Measurements of Forward Speed Effects on Jet Noise from Suppressor Nozzles and Comparison with Flight Test Data.
A. Atencio, Jr.. May 75, 10p NASA-TM-X-62449, A-6054
Subm-Prepared in Cooperation with Army Air Mobility R and D Lab., Moffett Field, Calif. Conf-Presented at Aiaa 8TH Fluid and Plasma Dyn. Conf., Hartford, 16-18 Jun. 1975.

Descriptors: *Conical nozzles, *Flight tests, *Jet aircraft noise, *Nozzle design, *Wind tunnel tests, Acoustics, Aerodynamic configurations, Noise measurement, Noise reduction.

For abstract, STAR 1317

N75-25947/3GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
The Effect of Circumferential Distortion on Fan Performance at Two Levels of Blade Loading.
M. J. Hartmann, and N. L. Sanger. 1975, 29p
NASA-TM-X-71746, E-8385
Conf-Presented at the 45TH Meeting of the Propulsion and Energetics Panel, Monterey, Calif., 22-26 Sep. 1975; Sponsored by AGARD.

Descriptors: *Flow distortion, *Loads (Forces), *Performance, *Rotor blades, Blade tips, Dynamic response, Static pressure, Temperature effects.

For abstract, STAR 1317

N75-25948/1GA PC$4.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Interim Prediction Method for Fan and Compressor Source Noise.
M. F. Heidmann. Jun 75, 83p NASA-TM-X-71763, E-8398

Descriptors: *Engine noise, *Noise generators, *Prediction analysis techniques, *Turbocompressors, *Turbofans, Noise intensity, Noise spectra, Performance prediction, Sound pressure, Turbofan engines, Turbojet engines.

For abstract, STAR 1317

N75-26058/8GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Performance of a Catalytic Reactor at Simulated Gas Turbine Combustor Operating Conditions.
D. N. Anderson, R. R. Tacina, and T. S. Mroz. Jun 75, 41p NASA-TM-X-71747, E-8381

Descriptors: *Combustion chambers, *Combustion efficiency, *Gas turbine engines, Air pollution, Combustion products, Engine design, Fuel-air ratio, Hydrocarbons.

For abstract, STAR 1317

N75-26303/8GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
Metal Temperatures and Coolant Flow in a Wire Cloth Transpiration Cooled Turbine Vane.
H. J. Gladden. Jun 75, 23p NASA-TM-X-3248, E-8249

Descriptors: *Coolants, *Flow characteristics, *Gas turbines, *Sweat cooling, *Temperature measurement, *Vanes, Heat transfer, Jet vanes, Oxidation resistance, Thermocouples, Transpiration.

For abstract, STAR 1317

21F. Nuclear Propulsion

TID/SNA-2057 PC$14.25/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Materials Data Release Memoranda.
1972, 225p

Descriptors: (*Nerva reactor, *Reactor materials), (*Inconel 718, *Tables), (*Stainless steel-347, Tables), (*Aluminium base alloys, Tables), Alloy-a-286, Bronze, Hastelloy x, Mechanical properties, Stainless steel-301, Stainless steel-310, Stainless steels, Titanium base alloys.

For abstract, see NSA 32 03, number 07060.

TID/SNA-2059 PC$4.00/MF$2.25
Anamet Labs., Inc., Berkeley, Calif.
Metallography of AISI 347 Sheet (.016") Creep Tested in Gh sub 2 at Battelle.
22 Oct 70, 20p

Descriptors: (*Stainless steel-347, *Creep), Images, Metallography, Nerva reactor, Pressure dependence, Ruptures, Temperature dependence, Time dependence.

For abstract, see NSA 32 03, number 07061.

TID/SNA-2081 PC$4.75/MF$2.25
New York State Office of Economic Research, Albany.
Evaluation of the Low-Cycle Fatigue Resistance of 347 Stainless Steel at 1000 exp 0 F.
Jul 71, 31p

Descriptors: (*Stainless steel-347, *Fatigue), Compression, High temperature, Nerva reactor, Strains.

For abstract, see NSA 32 03, number 07062.

TID/SNA-2112 PC$4.00/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Nuclear Rocket Materials Program.
J. J. Lombardo, and C. W. Funk. 1968, 8p

Descriptors: (*Nerva reactor, Reactor materials), (*Reactor materials, *Physical radiation effects), Bearings, Beryllium, Cryogenics, Frac-

ture properties, Graphite, Hastelloy x, Inconel 718, Mechanical properties, Thermal conductivity, Very low temperature, Waspaloy.

For abstract, see NSA 32 03, number 07191.

TID/SNA-2123 PC$4.50/MF$2.25
Aerojet-General Corp., Sacramento, Calif.
Cryogenic Radiation Effects on Nerva Structural Alloys.
C. E. Dixon, J. E. Stadig, and C. W. Funk. 1968, 28p

Descriptors: (*Nerva reactor, Reactor materials), (*Reactor materials, *Physical radiation effects), Alloy-a-286, Aluminium base alloys, Cryogenics, Gtr reactor, Hastelloy x, Inconel 625, Inconel 718, Mechanical properties, Titanium base alloys, Udimet alloys, Very low temperature, Waspaloy.

For abstract, see NSA 32 03, number 07192.

TID/SNA-2125 PC$4.00/MF$2.25
General Dynamics Corp., Fort Worth, Tex. Convair Aerospace Div.
Sharp Notch Tension Fracture Toughness Evaluation of Welded 6061-T6 Aluminum Alloy Sheet at -423 exp 0 F.
C. J. Kropp. Jun 71, 15p

Descriptors: (*Nerva reactor, *Reactor materials), (*Aluminium alloys, *Fracture properties), Cryogenics, Very low temperature.

For abstract, see NSA 32 03, number 07065.

WANL-TME-672(Pt.1) PC$4.00/MF$2.25
Westinghouse Electric Corp., Pittsburgh, Pa. Astronuclear Lab.
Gadolinium--Stainless Steel Development. Part I.
J. A. Begley. 3 Feb 64, 19p

Descriptors: (*Nerva reactor, *Nuclear poisons), (*Stainless steels, *Tensile properties), Fabrication, Gadolinium additions, Mechanical properties.

For abstract, see NSA 32 03, number 07026.

21G. Reciprocating Engines

N75-26376/4GA PC$3.25/MF$2.25
Division of Mechanical Engineering, Ottawa (Ontario).
The Calibration of a Deutz F8L413 Diesel and Development of an on-Board Bhp Indicator.
W. S. Heggie. Feb 75, 25p MET-515, NRC-14649

Descriptors: *Calibrating, *Diesel engines, *Ground effect machines, *Levitation, Fuel consumption, Power efficiency.

For abstract, STAR 1317

21H. Rocket Motors and Engines

N75-26009/1GA PC$7.00/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Hybrid Rocket Engines. Internal Ballistics and Design Hybridraketentriebwerke. Innenballistik und Auslegung.
R. H. Schmucker. 3 May 74, 189p TUM-LRT-DH-2
Subm-Sponsored Partly by Deut. Forschungsgemeinschaft.
Language in German.

Descriptors: *Hybrid propellant rocket engines, *Interior ballistics, *Rocket engine design, Burning rate, Combustion physics, Hybrid propellants, Ignition, Thrust control.

For abstract, STAR 1317

N75-26010/9GA PC$3.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Realization of a Dual Thrust Program for Hybrid Engines Zur Realisierung Eines Doppelschubprogrammes bei Hybridtriebwerken.
R. H. Schmucker. 30 Mar 74, 12p TUM-LRT-KB-2
Language in German.

Descriptors: *Hybrid propellant rocket engines, *Thrust programming, Burning rate, Concentricity, Dual thrust nozzles, Mixing, Propulsion system configurations, Thrust chambers.

For abstract, STAR 1317

N75-26011/7GA PC$4.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Flow Processes in Overexpanded Chemical Rocket Nozzles. Part 1: Flow Separation Stroemungsvorgaenge Beim Betrieb Ueberexpandierter Duesen Chemischer Raketentriebwerke, Teil 1: Stroemungsabloesung.
R. H. Schmucker. 3 Jul 73, 61p NASA-CR-143044, TUM-LRT-TB-7
Subm-Sponsored Partly by NASA, US Acad. Of Sci. And Deut. Forschungsgemeinschaft.
Language in German.

Descriptors: *Boundary layer separation, *Gas expansion, *Nozzle flow, *Rocket nozzles, *Separated flow, Chemical propulsion, Rocket engines, Space shuttles.

For abstract, STAR 1317

N75-26012/5GA PC$4.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Flow Processes in Overexpanded Chemical Rocket Nozzles. Part 2: Side Loads by a Symmetric Separation Stroemungsvorgaenge Beim Betrieb Ueberexpandierter Duesen Chemischer Raketentriebwerke. Teil 2: Seitenkraefte durch Unsymmetrische Abloesung.
R. H. Schmucker. 15 Sep 73, 60p TUM-LRT-TB-10-PT-2
Language in German.

Descriptors: *Chemical propulsion, *Gas expansion, *Load distribution (Forces), *Nozzle flow, *Separated flow, Boundary layer separation, J-2 engine, Lateral control, Rocket nozzles, Space shuttles.

For abstract, STAR 1317

N75-26013/3GA PC$3.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Flow Processes in Overexpanded Chemical Rocket Nozzles. Part 3: Methods for the Aimed Flow Separation and Side Load Reduction Stroemungsvorgaenge Beim Betrieb Ueberexpandierter Duesen Chemischer Raketentriebwerke. Teil 3: Methoden Zur Gezielten Stroemungsabloesung und Seitenkraftverringerung.
R. H. Schmucker. 20 Sep 73, 25p TUM-LRT-TB-11-PT-3
Language in German.

Descriptors: *Chemical propulsion, *Gas expansion, *Load distribution (Forces), *Nozzle flow, *Separated flow, Boundary layer separation, Lateral control, Nozzle efficiency, Nozzle inserts, Rocket engines.

For abstract, STAR 1317

N75-26014/1GA PC$3.75/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Side Loads and Their Reduction in Liquid Rocket Engines.
R. H. Schmucker. 1973, 40p TUM-LRT-TB-14
Subm-Sponsored in Part by US Natl. Acad. Of Sci. And Deut. Forschungsgemeinschaft. Conf-Presented at the 24TH Intern. Astronautical Congr., Baku, 7-13 Oct. 1973.

Descriptors: *Liquid propellant rocket engines, *Load distribution (Forces), *Rocket nozzles, Asymmetry, Boundary layer separation, Gas expansion, Lateral control, Nozzle flow, Nozzle geometry, Separated flow, Test firing.

For abstract, STAR 1317

N75-26015/8GA PC$3.75/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Preliminary Study of Various Space Tug Propulsion Systems.
H. L. Besser, W. M. Schauer, and R. H. Schmucker. 1973, 40p TUM-LRT-TB-15
Conf-Presented at the 24TH Intern. Astronautical Congr., Baku, 7-13 Oct. 1973.

Descriptors: *Feasibility analysis, *Propulsion system configurations, *Propulsion system performance, *Space tugs, Cryogenic rocket propellants, Mission planning, Performance prediction, Propellant sensitivity, Space shuttles, Storable propellants.

For abstract, STAR 1317

N75-26016/6GA PC$4.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Hybrid Tug: An Alternative Concept for the Space Shuttle Hybridtug - Ein Alternativkonzept fuer den Raumschlepper.
H. O. Ruppe, W. M. Schauer, and R. H. Schmucker. 13 Feb 74, 63p TUM-LRT-TB-17
Language in German.

Descriptors: *Hybrid propellant rocket engines, *Rocket engine design, *Space tugs, European space programs, Liquid oxygen, Propulsion system configurations, Space shuttles.

For abstract, STAR 1317

N75-26017/4GA PC$3.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Influence of Different Parameters on the Starting Behavior of Hybrid Engines der Einfluss Verschiedener Parameter Auf das Anfahrverhalten von Hybridtriebwerken.
R. H. Schmucker, and W. M. Schauer. 14 Apr 74, 22p TUM-LRT-TB-19
Language in German.

Descriptors: *Hybrid propellant rocket engines, *Ignition, *Ignition limits, *Mass balance, *Quasi-steady states, Liquid injection, Liquid oxidizers, Propellant evaporation.

For abstract, STAR 1317

21I. Rocket Propellants

N75-26008/3GA PC$5.25/MF$2.25
Rocketdyne, Canoga Park, Calif.
Low-Speed Inducers for Cryogenic Upper-Stage Engines.
Final Report.
W. R. Bissell, D. S. Jenkins, J. A. King, and E. D. Jackson. May 75, 124p NASA-CR-143872, R-9655
Contract NAS8-29189

Descriptors: *Cryogenic rocket propellants, *Engine inlets, *Rocket engines, Design analysis, Electric motors, Fuel pumps, Hydrogen fuels, Liquid oxygen, Performance tests, Two phase flow.

For abstract, STAR 1317

N75-26192/5GA PC$8.50/MF$2.25
Boeing Aerospace Co., Seattle, Wash.
Lightweight Vacuum Jacket for Cryogenic Insulation, Volume 1.
Final Report.
D. L. Barclay, J. E. Bell, E. W. Brogren, and J. W. Strasyer. Apr 75, 271p NASA-CR-134759, D180-18476-1
Contract NAS3-15848

Descriptors: *Cryogenic fluid storage, *Multilayer insulation, *Space shuttle orbiters, *Vacuum effects, Fuel tanks, Leakage, Lithium hydrides, Orbit maneuvering engine (Space shuttle), Scale models, Stiffness.

For abstract, STAR 1317

PATENT-3 744 971 Not available NTIS
Department of the Army Washington D C
Fuel-Metal Compatibility Test Unit.
Patent,
Vernon A. Lamb, Wahling H. Ng, and John P. Young. Filed 28 May 71, patented 10 Jul 73, 4p
Rept nos. PAT-APPL-148 063,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Liquid propellants, *Test methods, *Patents, Hydrazine, Decomposition, Compatibility, Test equipment, Aluminum, Maraging steels, Stainless steels, Molybdenum, Metal coatings.
Identifiers: PAT-CL-23-230-R.

The patent describes a method and test apparatus which measures gas produced by catalytic decomposition or chemical reaction of a hydrazine-type fuel and a metal specimen.

22. SPACE TECHNOLOGY

22A. Astronautics

N75-25981/2GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
Apollo Experience Report: Flight Anomaly Resolution.
J. D. Lobb. Jul 75, 74p NASA-TN-D-7968, JSC-S-412

Descriptors: *Apollo project, *Failure analysis, *Operational problems, *Postflight analysis, Deviation, Error correcting devices, Flight hazards, Irregularities, Malfunctions, Quality control.

For abstract, STAR 1317

N75-25982/0GA PC$8.75/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Technology in Space.
I. T. Belyakov, and Y. D. Borisov. Jul 75, 282p NASA-TT-F-16264
Contract NASW-2481
Tran-Transl. Into English of the Book "Tekhnologiya V Kosmose" Moscow, Mashinostroyeniye Press, 1974 291 p.

Descriptors: *Aerospace environments, *Space manufacturing, *Weightlessness, Cost analysis, Production engineering, Space environment simulation, U.s.s.r..

For abstract, STAR 1317

N75-25983/8GA PC$3.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Space for the People of the 20TH Century.
V. I. Sevastyanov. Jun 75, 7p NASA-TT-F-16437
Contract NASW-2481
Tran-Transl. Into English from Zemlya Vselennaya (Moscow), No. 2, Mar. - Apr. 1975 p 5-8.

Descriptors: *Aerospace sciences, *Populations, *Technology utilization, Salyut space station, Skylab program.

For abstract, STAR 1317

N75-25984/6GA PC$3.25/MF$2.25
Scientific Translation Service, Santa Barbara, Calif.
Work of the Cosmonauts a. A. Gubarev and G. M. Grechko in the Station Salyut-4.
Jun 75, 10p NASA-TT-F-16438
Contract NASW-2483
Tran-Transl. Into English from Zemlya Vselennaya (Ussr), No. 2, Mar. - Apr. 1975 p 2-4.

Descriptors: *Astronaut performance, *Cosmonauts, *Salyut space station, *Soyuz spacecraft, Biomedical data, Critical experiments, Spacecraft docking, U.s.s.r. space program.

For abstract, STAR 1317

N75-25985/3GA PC$7.25/MF$2.25
Academy of Sciences (USSR), Moscow.
Apollo-Soyuz Test Project.
1975, 204p

Descriptors: *Apollo soyuz test project, *Information, *News, *News media, Information dissemination, Space missions, U.s.s.r., United states of america.

For abstract, STAR 1317

N75-25987/9GA PC$0.30/MF$2.25
National Aeronautics and Space Administration, Washington, D.C.
Apollo-Soyuz Test Project.
1975, 8p NF-52/5-75

Descriptors: *Apollo soyuz test project, *Experimental design, *Rendezvous trajectories, *Spacecraft docking, *Systems compatibility, Mission planning, Nasa programs, Space manufacturing, U.s.s.r. space program.

For abstract, STAR 1317

N75-25989/5GA PC$10.25/MF$2.25
Kanner (Leo) Associates, Redwood City, Calif.
Space Navigation.
I. K. Bazhinov, V. I. Aleshin, V. N. Pochukayev, and V. S. Polyakov. Jul 75, 388p NASA-TT-F-16370
Contract NASW-2481
Tran-Transl. Into English of the Book "Kosmicheskaya Navigatsiya" Moscow, Mashinostroyeniye Press, 1975 352 p.

Descriptors: *Space navigation, *Trajectory optimization, Algorithms, Digital computers, Error analysis, Iterative solution, Onboard equipment.

For abstract, STAR 1317

N75-25991/1GA PC$3.25/MF$2.25
Michigan Univ., Ann Arbor. Radio Astronomy Observatory.
Imp-1 Satellite.
Final Scientific Report.
H. Alvarez. Feb 75, 5p NASA-CR-143807, UM/RAO-75-2
Contract NAS5-11174

Descriptors: *Explorer 34 satellite, *Satellite observation, *Type 3 bursts, Computer programs, Data processing.

For abstract, STAR 1317

N75-26665/0GA PC$3.25/MF$2.25
Minnesota Univ., Minneapolis.
Personnel Techniques Necessary to Maximize Bio-Barrier Integrity at a Martian Receiving Laboratory.
Annual Report, 1 Jul. 1974 - 30 Jun. 1975.
G. S. Michaelson, and T. A. Mahoney. 30 Jun 75, 13p NASA-CR-142963
Contract NGL-24-005-160

Descriptors: *Mars landing, *Personnel management, *Spacecraft contamination, Lunar receiving laboratory, Management planning, Mars surface.

For abstract, STAR 1317

22B. Spacecraft

AD-A013 721/6GA PC$3.75/MF$2.25
Aerospace Corp El Segundo Calif
A Concept of Despin Mechanical Assembly Life Testing Involving Total Characterization.
Interim rept.,
Seymour Feuerstein, and Arthur S. Forster. 29 Jul 75, 30p Rept no. TR-0076(6270-30)-3
SAMSO-TR-75-203
Contract F04701-75-C-0076

Descriptors: *Spacecraft components, *Bearings, *Spin stabilization, *Lubricants, *Life

tests, Reliability, Degradation, Slip rings, Lubrication.
Identifiers: Satellite despinning.

The critical requirements placed on the performance and life of moving mechanical assemblies in spacecraft demand the ultimate in reliability. Confidence levels must be established by testing units over time intervals that are significantly shorter than their intended application life. A concept of total mechanical assembly life testing through comprehensive instrumentation for early detection of system degradation is presented. Testing criteria and appropriate measurement techniques are discussed. On the basis of this approach, an advanced technology test program was initiated in 1972.

N75-25980/4GA PC$3.25/MF$2.25
National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
Apollo Experience Report: Guidance and Control Systems: Csm Service Propulsion System Gimbal Actuators.
W. A. Mcmahon. Jul 75, 14p NASA-TN-D-7969, JSC-S-444

Descriptors: *Apollo project, *Command service modules, *Gimbals, *Propulsion system performance, Actuators, Design analysis, Electromechanical devices, Performance tests, Propulsion system configurations, Thrust vector control.

For abstract, STAR 1317

N75-25992/9GA PC$5.25/MF$2.25
Technische Universitaet, Munich (West Germany). Lehrstuhl fuer Raumfahrttechnik.
Planning and Design of Spacecraft Entwurf und Auslegung von Raumfahrzeugen.
R. H. Schmucker, and W. M. Schauer. 3 Aug 73, 111p TUM-LRT-TB-8
Language in German.

Descriptors: *Interplanetary spacecraft, *Landing modules, *Launch vehicle configurations, *Spacecraft design, Cost analysis, Mission planning, Spacecraft components.

For abstract, STAR 1317

N75-25994/5GA PC$7.50/MF$2.25
Chrysler Corp., New Orleans, La. Space Div.
Results of a Space Shuttle Vehicle Ferry Configuration Afterbody Fairing Optimization Study Using a 140A/B 0.0405-Scale Model Orbiter (43-0) in the Rockwell International 7.75 by 11.0 Ft Low Speed Wind Tunnel (OA124).
S. R. Houlihan. Jun 75, 248p NASA-CR-141536, DMS-DR-2209
Contract NAS9-13247

Descriptors: *Afterbodies, *Ferry spacecraft, *Low speed wind tunnels, *Space shuttle orbiters, Aerodynamic brakes, Aerodynamic stability, Control surfaces, Scale models, Spacecraft configurations, Wind tunnel tests.

For abstract, STAR 1317

N75-25995/2GA PC$5.75/MF$2.25
National Aeronautics and Space Administration. Langley Research Center, Langley Station, Va.
Space Shuttle Orbiter Trimmed Center of Gravity Extension Study. Volume 1: Effects of Configuration Modifications on the Aerodynamic Characteristics of the 140 a/B Orbiter at Mach 10.3.
P. T. Bernot. Jun 75, 130p NASA-TM-X-72661

Descriptors: *Aerodynamic characteristics, *Space shuttle orbiters, *Spacecraft configurations, Angle of attack, Hypersonic wind tunnels, Longitudinal stability, Reynolds number, Wind tunnel tests.

For abstract, STAR 1317

N75-25997/8GA PC$7.00/MF$2.25
City Coll. of the City Univ. of New York. Dept. of Electrical Engineering.
Systems Analysis of the Space Shuttle.
Final Report, 17 Apr. 1974 - 18 Apr. 1975.
D. L. Schilling, S. J. Oh, and F. Thau. 17 Apr 75, 196p NASA-CR-141887
Contract NAS9-13940

Descriptors: *Computer systems design, *Space shuttles, *Spacecraft communication, *Spacecraft power supplies, Computer programs, Computerized simulation, Digital spacecraft television, Multiprocessing (Computers), Systems analysis.

For abstract, STAR 1317

N75-25998/6GA PC$3.25/MF$2.25
Lockheed-Georgia Co., Marietta.
Space Shuttle Structural Integrity and Assessment Study.
Executive Summary, Jun. 1972 - Jul. 1974.
Jul 74, 19p NASA-CR-139181
Contract NAS10-8018

Descriptors: *Nondestructive tests, *Space shuttles, *Structural analysis, Adhesive bonding, Fatigue (Materials), Materials tests, Stress corrosion cracking.

For abstract, STAR 1317

N75-25999/4GA PC$10.00/MF$2.25
Chrysler Corp., New Orleans, La. Space Div.
Results of Investigations on the 0.004-Scale Model 74-0 of the Configuration 4 (Modified) Space Shuttle Vehicle Orbiter in the NASA/Msfc 14-by-14-Inch Trisonic Wind Tunnel (OA131).
M. E. Nichols. Mar 75, 362p NASA-CR-141521, DMS-DR-2232
Contract NAS9-13247

Descriptors: *Scale models, *Space shuttles, *Spacecraft configurations, *Wind tunnel stability tests, Aerodynamic characteristics, Angle of attack, Boundary layer separation, Reentry effects, Reynolds number, Tables (Data), Transonic flow, Transonic wind tunnels.

For abstract, STAR 1317

N75-26000/0GA PC$7.50/MF$2.25
Boeing Aerospace Co., Seattle, Wash. Research and Engineering Div.
Effect of Damping on Excitability of High-Order Normal Modes.
Final Report.
D. H. Merchant, R. M. Gates, and J. W. Straayer. 30 May 75, 231p NASA-CR-143884, D180-18835-1
Contract NAS8-30655

Descriptors: *Damping, *Large space telescope, *Modes (Standing waves), *Normal shock waves, *Wave excitation, Attitude control, Computer programs, Dynamic models, Finite element method, Gyroscopes, Spacecraft stability.

For abstract, STAR 1317

N75-26309/5GA PC$7.25/MF$2.25
Calspan Corp., Buffalo, N.Y.
Experimental and Theoretical Study of Shuttle Lee-Side Heat Transfer Rates.
G. K. Mruk, J. Bertin, and J. P. Lamb. Mar 75, 203p NASA-CR-141890, ZC-5403-A-1
Contract NAS9-13707

Descriptors: *Heat transfer, *Space shuttle orbiters, *Wind tunnel tests, Hypersonic wind tunnels, Mach number, Reynolds number, Surface temperature.

For abstract, STAR 1317

N75-26313/7GA PC$3.75/MF$2.25
National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
Slip Conditions with Wall Catalysis and Radiation for Multicomponent, Nonequilibrium Gas Flow.
W. L. Hendricks. Jun 74, 34p NASA-TM-X-64942

Descriptors: *Catalysis, *Slip flow, *Space shuttles, *Thermal radiation, Atomic recombination, Boundary layer stability, Flow distribution, Heat transfer coefficients, Rarefied gases, Skin friction.

For abstract, STAR 1317

22C. Spacecraft Trajectories and Reentry

AD-A013 842/0GA PC$3.25/MF$2.25
Texas Univ At Austin Dept of Aerospace Engineering and Engineering Mechanics
Orbit Determination in the Presence of Unmodeled Accelerations.
Final rept. 1 Dec 71-1 Nov 74,
B. D. Tapley. 1975, 18p AFOSR-TR-75-1073
Grant AF-AFOSR-2233-72

Descriptors: *Orbits, Aerodynamic drag, Periodic variations, Algorithms, Atmospheric density, Artificial satellites.
Identifiers: *Spacecraft trajectories.

This report summarizes the results of three years work on Grant AFOSR 72-2233. Based on the results obtained during the course of study, it can be concluded that using observations from topocentric tracking stations, the Dynamic Model Compensation Method can be used to obtain an accurate approximation of the unmodeled aerodynamic forces acting on a space vehicle due to (1) Uncertainties in the atmospheric model and (2) Variations in the drag parameter. The accuracy of the estimate will be influenced by the accuracy and density of the observations and the tracking station distribution. The observation accuracy requirements for successful implementation require participating satellites; that is, accurate estimates of the density cannot be obtained with 'skintrack' or passive observations. However, there are alternate formulations which hold potential for drag estimation using passive satellite observations.

AD-A013 969/1GA PC$9.25/MF$2.25
RCA International Service Corp Patrick AFB Fla Missile Test Project
Transformations Applicable to Missile and Satellite Trajectory Computations.
Final rept. Jun 74-Jun 75,
John J. O'Connor. Jul 75, 318p AFETR-TR-75-29
Contract F08606-72-C-0030

Descriptors: *Guided missile trajectories, *Transformations(Mathematics), *Computations, Orbits, Matrices(Mathematics), Coordinates, Differential equations.
Identifiers: *Spacecraft trajectories.

This report is a self-contained treatment of transformations with applications to missile and satellite technology. Numerous examples are included in the areas of specific tracking systems, geodetic transformations, earth-fixed and inertial systems, time transformations, transformations of a statistical nature and error analysis.

N75-25873/1GA PC$4.25/MF$2.25
National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
Wind Tunnel Pressure Signatures for a 0.0041-Scale Model of the Space Shuttle Orbiter.
J. P. Mendoza. May 75, 69p NASA-TM-X-62432, A-6067

Descriptors: *Pressure measurements, *Space shuttle orbiters, *Wind tunnel models, Aerodynamic configurations, Delta wings, Sonic booms.

For abstract, STAR 1317

22D. Spacecraft Launch Vehicles and Ground Support

N75-25986/1GA PC$3.75/MF$2.25
LTV Aerospace Corp., Dallas, Tex. Vought Systems Div.
A Feasibility Study for Scout Polar Launches from NASA Wallops Flight Center.
Final Report, 10 Jun. 1974 - 25 Jan. 1975.
T. R. Myler. Jun 75, 33p NASA-CR-2555
Contract NAS1-12500

Descriptors: *Launching sites, *Polar orbits, *Preflight analysis, *Scout launch vehicle, *Wallops island, Feasibility analysis, Impact prediction, Launch vehicle configurations, Performance prediction, Safety management, Trajectory analysis.

For abstract, STAR 1317

MAIL ORDER TO:

National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22161

Date _____

SHIP TO: (Enter if different from address at left.)

PURCHASER:

Name _____

Address _____

City, State, Zip _____

Attention: _____

Name _____

Organization _____

Address _____

City, State, ZIP _____

(703) 321-8543 TELEX 89-9405

- ☐ Charge my NTIS deposit account no. _____
- ☐ Send me an application for an NTIS deposit account.
- ☐ Purchase order no. _____
- ☐ Check enclosed for $_____
- ☐ Bill me (not applicable to foreign orders) add $5 per order.
- ☐ Charge to my American Express Card account number.

☐☐☐ ☐☐☐ ☐☐☐ ☐ ☐☐☐

_____
Signature

Wherever a foreign sales price is NOT specified in the listings, all foreign buyers must add the following charges to each order.
$2.50 for each document
$1.50 for each microfiche

FOR DDC USERS ONLY
DDC USER CODE _____
CONTRACT NUMBER _____
(LAST 6 CHARACTERS ONLY)

Routing Code. NTIS can label each document for routing within your organization. If you want this service put your routing code in the box marked Routing Code.

Document Number	Routing Code	Check one		Quantity	Unit Price	Total Price
		Paper Copy	Micro fiche			
					Enter Grand Total →	$

COSATI Subject Fields

1	AERONAUTICS • SUBJECT INDEX
2	AGRICULTURE • PERSONAL AUTHOR INDEX
3	ASTRONOMY AND ASTROPHYSICS • CORPORATE AUTHOR INDEX
4	ATMOSPHERIC SCIENCES • CONTRACT NUMBER INDEX
5	BEHAVIORAL AND SOCIAL SCIENCES • ACCESSION/REPORT NUMBER INDEX
6	BIOLOGICAL AND MEDICAL SCIENCES
7	CHEMISTRY
8	EARTH SCIENCES AND OCEANOGRAPHY
9	ELECTRONICS AND ELECTRICAL ENGINEERING
10	ENERGY CONVERSION (NON-PROPULSIVE)
11	MATERIALS
12	MATHEMATICAL SCIENCES
13	MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING
14	METHODS AND EQUIPMENT
15	MILITARY SCIENCES
16	MISSILE TECHNOLOGY
17	NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES
18	NUCLEAR SCIENCE AND TECHNOLOGY
19	ORDNANCE
20	PHYSICS
21	PROPULSION AND FUELS
22	SPACE TECHNOLOGY

U.S.MAIL

POSTAGE AND FEES PAID
U.S. DEPARTMENT OF COMMERCE
COM 211

AN EQUAL OPPORTUNITY EMPLOYER

U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
5285 Port Royal Road
Springfield, VA 22161

OFFICIAL BUSINESS
PRINTED MATTER